



# TASCAM

TEAC Professional Division

## SERVICE MANUAL

# 644

## MIDISTUDIO

### NOTES

As regards the resistors and capacitors, refer to the circuit diagram and the PCB Assy drawings contained in this manual.

- \* Parts marked with \* require longer delivery time.
- \* Resistor values are in ohms (Ω) = 1,000 ohms, M = 1,000,000 ohms.
- \* All capacitor values are in microfarads (μ = microfarad).
- \* Parts marked with this symbol are safety critical components. They must always be replaced with identical components — refer to the "SAC parts list and ensure exact replacement.
- \* PCB is referenced to TV in this manual unless otherwise specified.
- \* PCB boards shown are viewed from top (upper) side.
- \* Parts not shown in the parts lists or parts through listed, having no parts numbers are not general "ready to supply" parts.

### 注意

抵抗値及び容量値は、回路図及び基板組立図に示す通り、必ず正確に取付けを行ってください。

1. \*印の部品は、納期が長い場合があります。
2. 抵抗値は、Ωは1,000Ω、Mは1,000,000Ωを示します。
3. 容量値は、μはマイクロファラッドを示します。
4. \*印の部品は、安全上の理由から必ず同等の部品で交換してください。
5. PCBは、このマニュアルで指定されていない限り、TVとします。
6. 基板組立図は、上側（上板側）からの図面です。
7. 部品リストや部品図面に記載されていない部品は、一般的に在庫品として扱っていません。

### 警告

Lithium-ion / High-voltage battery  
 Look through this fan for signs of an open fire.  
 If you see a fire, call the fire department.  
 Do not touch the fan cover.  
 Do not touch the fan cover.  
 Do not touch the fan cover.

# 1. SPECIFICATIONS

仕 様

## MECHANICAL CHARACTERISTICS

|                        |   |
|------------------------|---|
| Tape                   | Compact cassette (C-30 to 90), Hi-Bias type II (CrO <sub>2</sub> ) tape   |
| Track Format           | 4-track, 4-channel, single directional record/play  |
| Head Configuration     | 1 4-channel record play (Permalloy),<br>1 4-channel erase (ferrite)   |
| Motor                  | 1 DC servo capstan motor,<br>1 DC reel motor<br>1 DC ancillary motor  |
| Tape Speed             | 9.5 cm/sec., 3-1/2 ips (HIGH) and 4.8 cm/sec., 1-7/8 ips (LOW), $\pm 1.0\%$   |
| Pitch Control          | $\pm 12\%$ (approx.)  |
| Wow and Flutter        | HIGH: 0.04% WRMS, $\pm 0.06\%$ with peak<br>LOW: 0.06% WRMS, $\pm 0.1\%$ with peak  |
| Fast Winding Time      | 80 sec. (approx.) with C-60   |
| Power Supply           | DC $\pm 10V$ , from PS-M1 Adapter Unit provided; Consumption 18W  |
| Dimensions (W x H x D) | 516 x 120.5 x 400 mm (20-5/16" x 4-3/4" x 15-3/4")<br>AC Adapter: 113 x 61 x 74 mm (4-7/16" x 2-3/8" x 2-15/16");<br>AC cord 1800 mm (5.9 ft.); AC adapter 1 kg (2-3/16 lbs.) |
| Weight                 | 7.2 kg (15-14/16 lbs.); AC adapter 1 kg (2-3/16 lbs.)   |

## ELECTRICAL CHARACTERISTICS

### Mixer Section

#### MIC (LINE A) Input (1/4 Phone Jack x 8)

|                     |   |
|---------------------|---|
| Source Impedance    | Less than 10k ohms  |
| Input Impedance     | 100k ohms   |
| Nominal Input Level | -50 dBV (3mV) to -10 dBV (0.3V), ch's 1/9 thru 6/14;<br>-55 dBV (1.5mV) to -10 dBV (0.3V), Ch. 7/15 thru 8/16 |
| Maximum Input Level | +10 dBV (3.0V), trim min., ch's 1/9 thru 6/14;<br>+8 dBV (2.2V), trim min., ch's 7/15 thru 8/16               |

#### MIC (BAL) Input (XLR Balanced x 2)

|                     |                                   |
|---------------------|-----------------------------------|
| Mic Impedance       | Less than 600 ohms                |
| Input Impedance     | 2.8k ohms                         |
| Nominal Input Level | -70 dBV (0.3mV) to -25 dBV (56mV) |
| Maximum Input Level | +8 dBV (2.2V), trim min.          |

#### LINE (B) Input (1/4 Phone Jack x 8)

|                     |                |
|---------------------|----------------|
| Input Impedance     | 10k ohms       |
| Nominal Input Level | -10 dBV (0.3V) |
| Maximum Input Level | +10 dBV (3.0V) |

#### INSERT (1/4 Phone Jack x 8)

|                        |                |
|------------------------|----------------|
| — Send (Tip) —         |                |
| Output Impedance       | 100 ohms       |
| Nominal Load Impedance | 10k ohms       |
| Minimum Load Impedance | 2k ohms        |
| Nominal Output Level   | -10 dBV (0.3V) |
| Maximum Output Level   | +10 dBV (3.0V) |
| — Receive (Ring) —     |                |
| Input Impedance        | 5k ohms        |
| Nominal Input Level    | -10 dBV (0.3V) |
| Maximum Output Level   | +10 dBV (3.0V) |

|   |  |
|---|--|
| <b>EFFECT RETURN (1/4 Phone Jack x 4)</b>                             |  |
| Input Impedance   | 20k ohms   |
| Nominal Input Level   | -10 dBV (0.3V)   |
| Minimum Output Level  | +10 dBV (3.0V)   |
| <b>GROUP OUT (RCA Jack x 4)</b>                                       |  |
| Output Impedance  | 100 ohms   |
| Nominal Load Impedance  | 10k ohms   |
| Minimum Load Impedance  | 2k ohms  |
| Nominal Output Level  | -10 dBV (0.3V)   |
| Maximum Output Level  | +10 dBV (3.0V)   |
| <b>AUX OUT (1/4 Phone Jack x 2)</b>                                   |  |
| Output Impedance  | 100 ohms   |
| Nominal Load Impedance  | 10k ohms   |
| Minimum Load Impedance  | 2k ohms  |
| Nominal Output Level  | -10 dBV (0.3V)   |
| Maximum Output Level  | +10 dBV (3.0V)   |
| <b>DUAL OUT (1/4 Phone Jack x 2)</b>                                  |  |
| Output Impedance  | 100 ohms   |
| Nominal Load Impedance  | 10k ohms   |
| Minimum Load Impedance  | 2k ohms  |
| Nominal Output Level  | -10 dBV (0.3V)   |
| Maximum Output Level  | +10 dBV (3.0V)   |
| <b>MONITOR OUT (RCA Jack x 2)</b>                                     |  |
| Output Impedance  | 100 ohms   |
| Nominal Load Impedance  | 10k ohms   |
| Minimum Load Impedance  | 2k ohms  |
| Nominal Output Level  | -10 dBV (0.3V)   |
| Maximum Output Level  | +10 dBV (3.0V)   |
| <b>PHONES OUT (1/4 Phone Jack x 2)</b>                                |  |
| Nominal Load Impedance  | 8 ohms   |
| Maximum Output Level  | +100mW + 100mW   |
| <b>EQUALIZER</b>  |  |
| HIGH (Shelving)   | 10 kHz, $\pm 12$ dB  |
| MID (Peaking)   | 250 Hz to 5 kHz, sweepable, $\pm 15$ dB  |
| <b>Recorder Section</b>   |  |
| Record/Play Channel   | 4 in number  |
| Noise Reduction   | dbx NR (each channel switchable separately; channel 4 disconnected from NR for as long as the SYNC switch is on) |
| <b>TAPE OUT (1/4 Phone Jack x 4)/<br/>EXT SYNC OUT (RCA Jack x 1)</b> |  |
| Output Impedance  | 100 ohms   |
| Nominal Load Impedance  | 10k ohms   |
| Minimum Load Impedance  | 2k ohms  |
| Nominal Output Level  | -10 dBV (0.3V)   |
| <b>EXT SYNC IN (RCA Jack x 1)</b>                                     |  |
| Input Impedance   | 10k ohms   |
| Nominal Input Level   | -10 dBV (0.3V)   |
| Minimum Input Level   | -16 dBV (0.15V)  |
| <b>TYPICAL PERFORMANCES</b>   |  |
| <b>Mixer Section</b>  |  |
| Frequency Response  | 20 Hz to 20 kHz, +1/-2 dB  |
| Signal-to-Noise Ratio<br>(at Nominal Input Level)                     | (UNWTD (20 Hz to 20 kHz)/IHF A WTD)  |
| 8 Mics to 1 Group Out   | 66 dB/67 dB  |

|                                 |  |
|---------------------------------|--|
| 1 Mic to 1 Group Out            | 69 dB/74 dB  |
| 8 Line B's to 1 Group Out       | 71 dB/72 dB  |
| 1 Line B to 1 Group Out         | 71 dB/78 dB  |
| Total Harmonic Distortion (THD) |  |
| 1 Mic to 1 Group Out            | 0.06%, at 1 kHz (20 dB above nominal input level, low-pass filter, 30 kHz, inserted) |
| 1 Line B to 1 Group Out         | 0.04%, at 1 kHz (nominal input level)  |
| Crosstalk                       | 60 dB, at 1 kHz  |

### Recorder Section

|                                 |  |
|---------------------------------|--|
| Frequency Response (Overall)    |  |
| HIGH                            | 40 Hz to 16 kHz, $\pm 3$ dB (without dbx)              |
| LOW                             | 40 Hz to 12.5 kHz, $\pm 3$ dB (without dbx)            |
| Signal-to-Noise Ratio (Overall) |  |
| (Ref. to 3% THD)                | UNWTD (20 Hz to 20 kHz)/IHF A WTD)                     |
| HIGH                            | 55 dB/58 dB (without dbx)<br>90 dB/93 dB (with dbx)    |
| LOW                             | 54 dB/57 dB (without dbx)<br>88 dB/91 dB (with dbx)    |
| Total Harmonic Distortion       |  |
| HIGH                            | 1.0% (400 Hz, 0 dB)                                    |
| LOW                             | 1.0% (400 Hz, 0 dB)                                    |
| Crosstalk (adjacent channels)   | 70 dB (with dbx);<br>50 dB (without dbx) (1 kHz, 0 dB) |
| Erasure                         | 65 dB (1 kHz, +10 dB)                                  |

In these specifications, 0 dBV is referenced as 1.0 Volt rms. Actual voltage levels are also given in parenthesis.

To calculate the 0 dB = 0.775

Volt reference level (i.e., 0 dBu or dBm in a 600 ohm circuit) add 2.2 dB to the listed dBV value, i.e., 0 dBV = +1.0 volt = +2.2 dBm.

Changes in specifications and features may be made without notice or obligation.

\* dbx is a registered trademark of dbx Incorporated.

●この仕様中の0dBVは1.0Vを基準としています。実際の電圧も( )で示しています。

●仕様及び外観は改善のため予告なく変更することがあります。

\*dbxはdbxインコーポレーテッドの登録商標です。

## 2. OPENING THE UNIT CABINET

### 本体ケースの開け方

1. Remove 9 screws (a) from the bottom of the cabinet as shown in Figure 2-1.

1. ボトム・ケースのネジ (a) 9本 (図2-1)を外す。

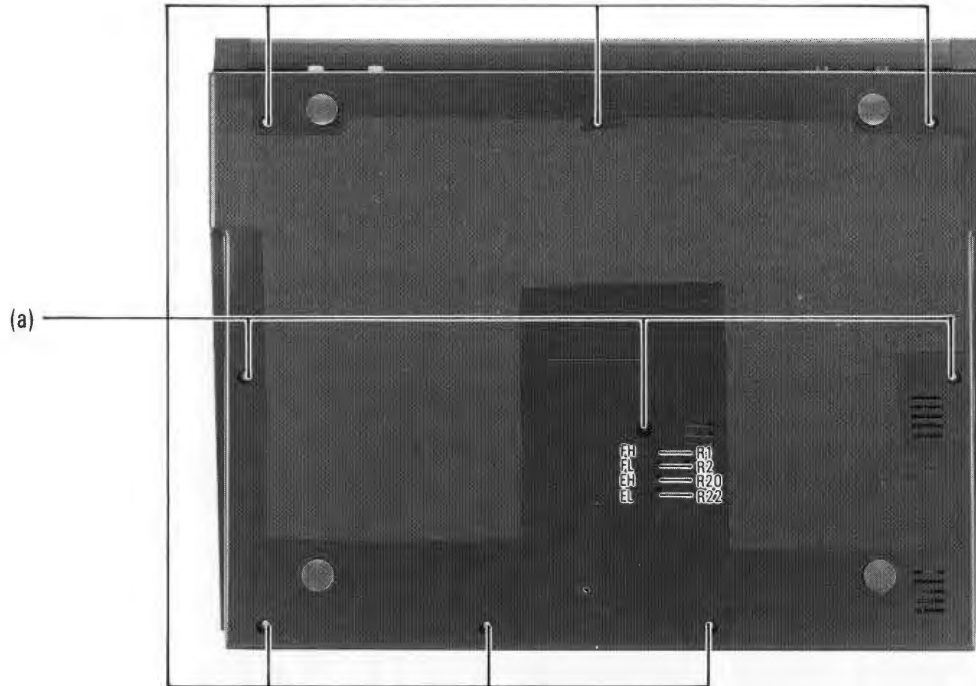


Fig. 2-1

図2-1

2. Remove 3 screws (b) from the connector panel as shown in Figure 2-2.

2. コネクタ・パネルのネジ (b) 3本 (図2-2)を外す。

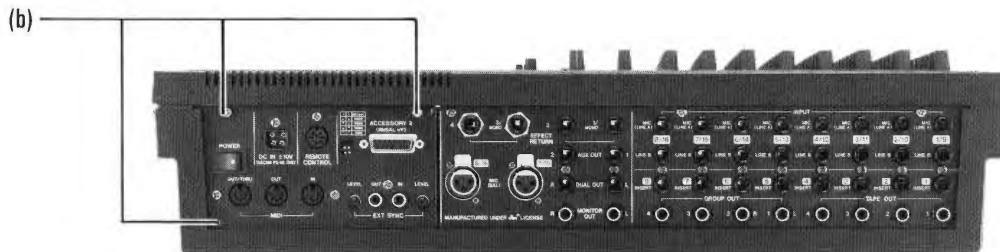


Fig. 2-2

図2-2

3. Remove knobs for the tape speed selector, tape speed mode selector, and pitch control as shown in Figure 2-3. The knobs can be removed by pulling upward.
4. Remove 2 screws (c) shown in Figure 2-3.
5. After removing all the screws specified above, open the cabinet by lifting the rear side of the cabinet. When adjustments are required on the amplifier etc., lift the rear side of the cabinet and place approx. 30cm-long prop between the bottom and rear side of the cabinet. (Refer to Figure 2-4)

**Note:** When opening or closing the cabinet, take care not to damage the wires coming from the printed circuit board as they are short.

3. テープ・スピード・セクタ・ノブ、テープ・スピード・モード・セクタ・ノブ、ピッチ・コントロール・ノブ (図2-3)を外す。ノブは上に引っ張れば外れます。
  4. 図2-3のネジ(c) 2本を外す。
  5. 以上のネジ等を外した後、上ケースの後方を持ち上げる様にしてケースを開けます。  
アンプの調整等のときは上ケースを持ち上げた後、ボトム・ケースと上ケースの後方を 30cm ぐらいのつかえ棒で支えてください。(図2-4 参照)
- 注. PCBからの線材が短いので開閉のときには、充分注意をして下さい。



Fig. 2-3  
☒2-3

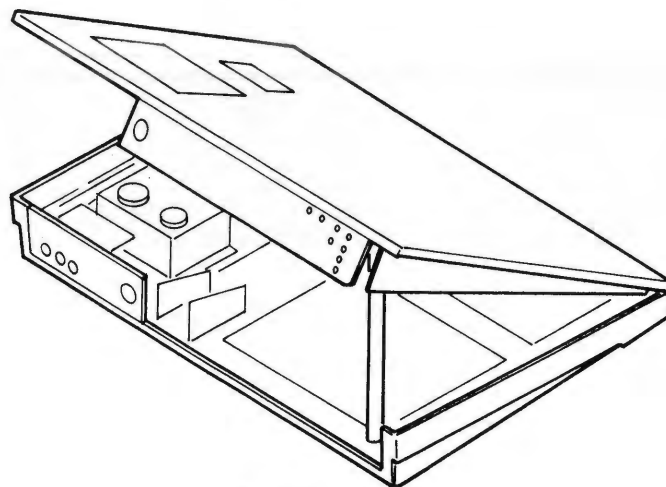


Fig. 2-4  
☒2-4

### 3. PARTS LOCATION

部品配置図

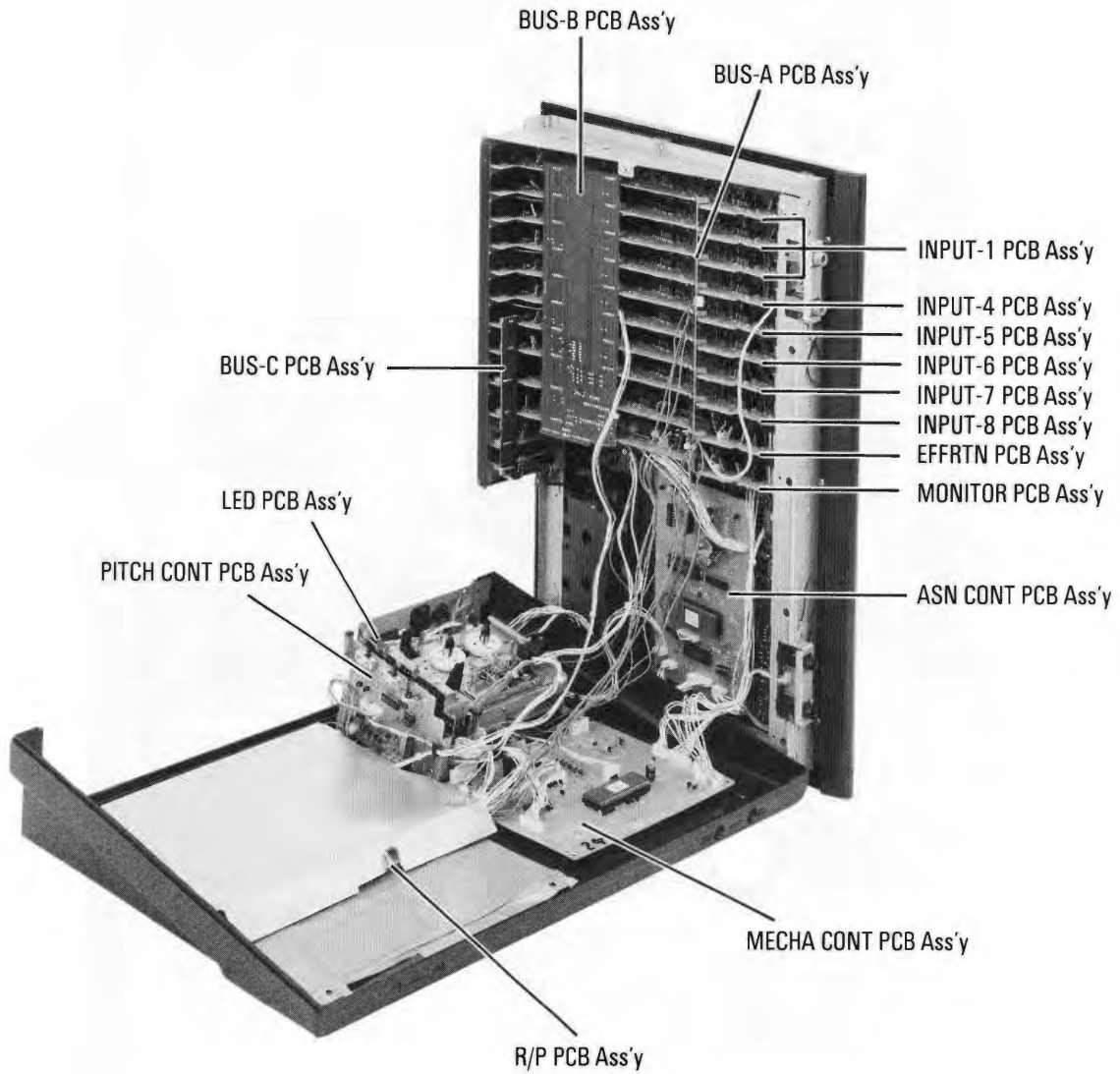


Fig. 3-1

図 3-1

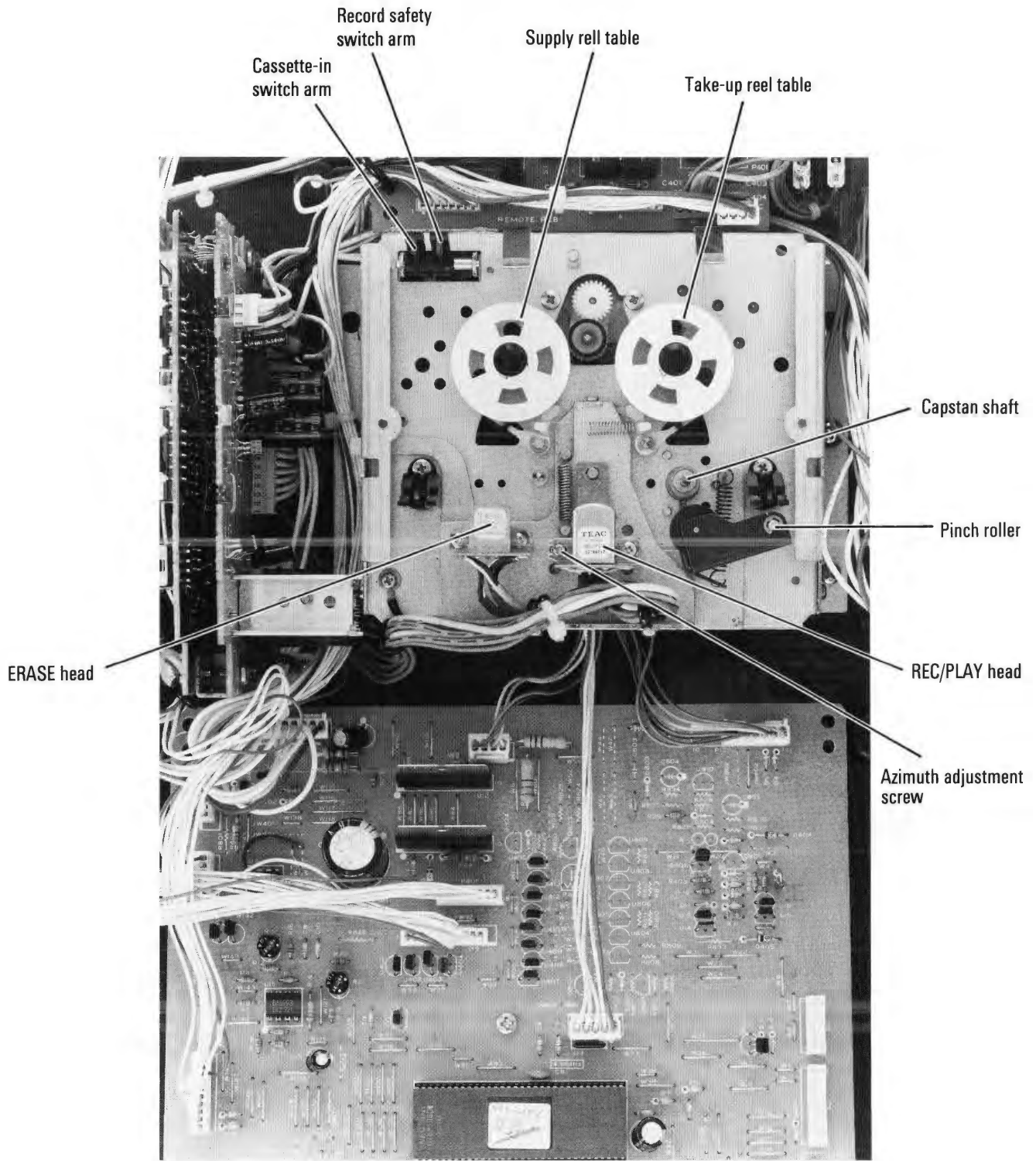


Fig. 3-2  
☒ 3-2



## 4. MECHANICAL CHECKS AND ADJUSTMENTS

### 機構部の確認と調整

#### 4-1. Test Tapes

##### 1. Cassette Torque Meter

- \* SRK-CT-W100 manufactured by Sansei Riko Co.  
Take-up and supply torque checking  
T.T.: 0 - 120 g/cm  
B.T.: 0 - 14 g/cm

- \* TW-2231 Manufactured by Sony Corp.  
Fast-forward and rewind torque checking  
0 - 200 g/cm

##### 2. Mirror Tape

- \* TEAC MTT-902T  
Tape path checking

##### 3. Test Tapes

- \* TEAC MXT-111 (high speed)
- \* TEAC MTT-111N (low speed)  
Tape speed check  
Wow-flutter (playback) check
- \* TEAC MTT-5561 Chrome type, blank tape
- \* TEAC MXT-116 Head azimuth check

#### 4-2. Pinch Roller Pressure

1. Push up the cassette-in switch (Figure 3-2) and place the unit in the play mode. Keep pushing up during measurement.
2. Hook the spring gauge to the pinch roller arm.
3. Pull the spring gauge in the direction as shown in Figure 4-1 until the pinch roller comes completely apart from the capstan shaft, then slowly return the spring gauge back so that the pinch roller comes in contact again with the capstan shaft.
4. Measure the force at the point when the pinch roller starts rotating. The reading should be within the specification of 380 to 500g.

#### 4-1. テスト・テープ

1. カセット・トルク・メータ
  - ・サンセイ理工製 SRK-CT-W100  
テイク・アップ, サプライ・トルク チェック  
T.T.: 0 ~ 120g・cm  
B.T.: 0 ~ 14g・cm
  - ・ソニー製 TW-2231  
F.FWD, REW トルク チェック  
0 ~ 200g・cm
2. ミラー・テープ
  - ・TEAC MTT-902T  
テープ・パス チェック
3. テスト・テープ
  - ・TEAC MXT-111 (HIGH SPEED)
  - ・TEAC MTT-111N (LOW SPEED)  
テープ・スピード チェック  
ワウ・フラッター (再生法) チェック
  - ・TEAC MTT-5561  
クロム・タイプ, ブランク・テープ
  - ・TEAC MXT-116  
ヘッド・アジマス チェック

#### 4-2. ピンチ・ローラ圧着力

1. カセット・イン・スイッチ・アーム (図3-2)を上方に押し、プレイ・モードにする。測定中、スイッチ・アームは上方に押し続けること。
2. ピンチ・アームにバネ秤を掛ける。
3. ピンチ・ローラがキャプスタン・シャフトから完全に離れるように秤を矢印の方向 (図4-1)に引張った後、ピンチ・ローラが再びキャプスタン・シャフトに接触するように徐々に戻す。
4. ピンチ・ローラが回り始めるときの値を読む。  
規格: 380 ~ 500g

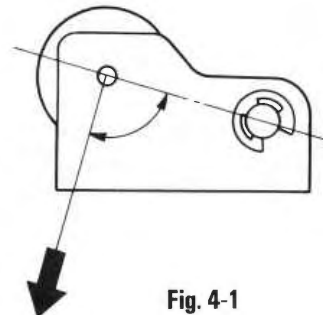


Fig. 4-1

図4-1

### 4-3. Tape Running

Run the mirror tape MTT-902T in the play mode and check to see if the tape has no curl at every guide point. If the tape has curl at the upper side of the guides, replace the 0.1 mm spacer between the tape head and the head base with the 0.2 mm spacer. If the tape has curl at the lower side, remove the 0.1 mm spacer.

R/P head spacer 0.1mm: P/N 5800595000  
 0.2mm: P/N 5800595100  
 Erase head spacer 0.1mm: P/N 5800556200  
 0.2mm: P/N 5801197800

### 4-4. Head Azimuth Alignment

The head azimuth alignment should be made only on the record/playback head.

1. Connect the tape-out terminal of the channel 1 to the vertical side of an oscilloscope and the tape-out terminal of the channel 4 to the horizontal side. (Refer to Figure 4-2)

### 4-3. テープ走行

ミラー・テープ MTT-902T をPLAY状態で走行させて、各ガイド部でテープのカールがないかをチェックします。そのときガイドの上でテープがカールしている場合は、ヘッドとヘッド・ベースの間にあるスペーサーを0.1mm から0.2mm に変更する。ガイドの下でカールしている場合は、0.1mm のスペーサーを取り外す。

R/P HEADスペーサー 0.1mm : P/N 5800595000  
 0.2mm : P/N 5800595100  
 ERASE HEADスペーサー 0.1mm : P/N 5800556200  
 0.2mm : P/N 5801197800

### 4-4. ヘッド・アジマス

ヘッド・アジマスの調整は、録音・再生ヘッドのみです。

1. 図4-2の様に1ch のTAPE OUTをオシロスコブのVER 側に、4ch のTAPE OUTをHOR 側に接続する。

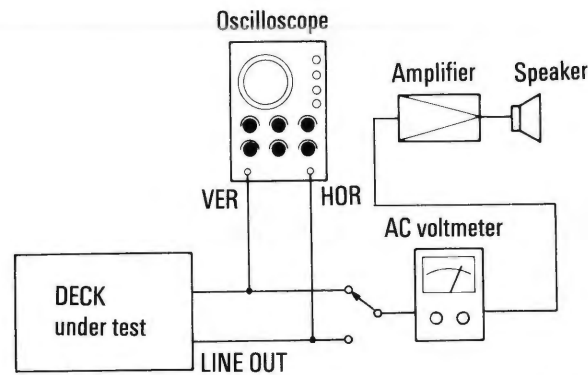


Figure shows measurements being performed on Ch-1 and Ch-4.

Fig. 4-2 Test setup for azimuth check

図4-2 位相測定接続図

2. Set the tape speed at the high position and play back the 315 Hz and 6.3 kHz signals of the test tape MXT-116. Adjust the azimuth adjustment screw (Figure 3-2) to get the same phase on the channels 1 and 4.
2. テープ・スピードをHIGHにし、テスト・テープ MXT-116の315Hz と6.3kHzを再生して、1ch と4ch の位相を合わせるようにアジマス調整ネジ (図3-2)を調整する。
3. 1-3, 1-2ch の位相が45° 以内であることを確認する。(図4-3 参照)

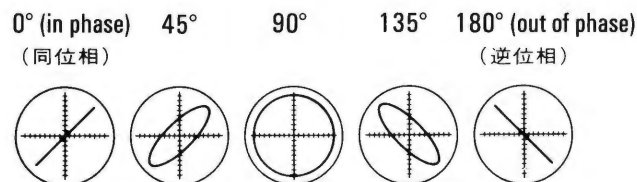


Fig. 4-3 Confirming phase relationship

図4-3 位相

#### 4-5. Reel Torque

##### 1. Take-up Torque/Back Tension

Attach the take-up torque/back-tension cassette torque meter (Model SRK-CT-W100) and place the unit in the playback mode and read the torque meter. If the meter pointer fluctuates, obtain the center figure. The reading should be: Take-up torque (the right side reel base): 25 - 60 g/cm Back-tension (the left side reel base): 2 - 6 g/cm

##### 2. Fast-Forward/Rewind Torque

Attach the cassette torque meter (Model TW-2231) and measure the starting torque of the fast-forward and rewind operations.

The measurement should be:

Fast-forward (the right side reel base): 100 - 170g/cm

Rewind (the left side reel base): 100 - 170g/cm

#### 4-6. Tape Speed

The tape speed adjustment should be carried out separately on the high speed mode and low speed mode.

##### 1. Connect the frequency counter to either one of the tape-out jacks.

##### 2. Set the pitch control switch to the fix position.

##### 3. Turn on the power by pressing the Power switch on the rear panel.

##### 4. To warm up the unit by rotating the capstan motor, load a test tape and maintain this status for at least 1 minute.

##### 5. Play back the mid portion of the test tape and adjust the semi-fixed resistor on the Pitch Control PCB assembly (Figure 2-1) to obtain 3000Hz $\pm$ 5Hz reading on the frequency counter.

High speed: R1

Low speed: R2

##### 6. After making adjustments, make sure that the tape speed at the beginning and the end of the tape winding is within the following figures.

Speed deviation: 3000Hz  $\pm$  45Hz

Fluctuation: 10Hz

##### 7. Place the Pitch Control switch to the EXT position and short circuit the Pins 1 and 13 of the Accessory-2 terminals (D-SUB connectors) on the rear panel.

##### 8. Connect an external oscillator to the pins 7 (hot) and 14 (cold) of the Accessory-2 terminals, then input the pulse signal of the reference frequency 9.6 kHz.

#### 4 - 5. リール・トルク

##### 1. テイク・アップ・トルク/バック・テンション

カセット・トルク・メータ (SRK-CT-W100) を装填後、プレイ・モードにしトルク・メータの値を読む。振れのある場合は中心値とする。規定値は次の通りです。

テイク・アップ・トルク (右リール台) : 25 ~ 60g.cm

バック・テンション (左リール台) : 2 ~ 6g.cm

##### 2. F. F./REW トルク

カセット・トルク・メータ (TW-2231) を装填し、F.F.動作及びREW動作の起動トルクをそれぞれ測定する。規定値は次の通りです。

F.F.トルク (右リール台) : 100 ~ 170g.cm

REWトルク (左リール台) : 100 ~ 170g.cm

#### 4 - 6. テープ速度

テープ速度の調整は、HIGH SPEEDとLOW SPEED でそれぞれ行ってください。

##### 1. 周波数カウンタを TAPE OUT ジャックのいずれかに接続する。

##### 2. ピッチ・コントロール・スイッチを FIXにする。

##### 3. POWER スイッチをオンにする。

##### 4. キャプスタン・モータを回転させウォーミング・アップする為にテスト・テープを装填し、少なくとも1分間そのままにしておく。

##### 5. テスト・テープの中間部を再生させて、周波数カウンタの値が 3000Hz $\pm$ 5Hz になるように PITCH CONT PCB ASS'Y の半固定抵抗 (図2-1)を調整する。

HIGH SPEED : R1

LOW SPEED : R2

##### 6. 調整後、テープの巻き始めと巻き終わりにて下記の値が得られるか確認する。

速度偏差 : 3000Hz  $\pm$  45Hz

変動幅 : 10Hz

##### 7. ピッチ・コントロール・スイッチを EXTにし、リア・パネルのアクセサリ-2端子 (D-SUB・コネクタ) の1ピンと13ピンをショートする。

##### 8. アクセサリ-2端子の7ピン (HOT) と14ピン (COLD) に外部発振器を接続し、基準周波数9.6kHzのパルス信号を入力する。

9. Set the tape speed to the High position and play back the test tape MXT-111, then adjust the semi-fixed resistor R20 (Figure 2-1) on the Pitch Control PCB assembly so that the frequency counter indicates 3000Hz  $\pm$  5Hz.
10. Next, set the tape speed at the Low position and play back the test tape MTT-111N. Adjust the semi-fixed resistor R22 (Figure 2-1) in the same manner as the step 9 above.

#### 4-7. Wow and Flutter

**Note:** Take the measurements based on the playback specifications and measure the tape speed at the beginning of tape winding, mid portion, and the end of tape winding. (But, if the test tape's graduation is marked in half increments, exclude one graduation. If there is only one peak value in 15 seconds, do not count this.)

1. Connect the wow-flutter meter to the tape deck under test as shown on Figure 4-4.
2. Load and play back the test tape or equivalent tape.
3. Measure the wow-flutter ratio based on the following specifications.  
 High speed: less than 0.04% WRMS (weighting)  
 Low speed: less than 0.06% WRMS (weighting)

9. テープ・スピードをHIGHにし、テスト・テープ MXT-111を再生し、周波数カウンタが 3000Hz  $\pm$  5Hz を示す様にPITCH CONT PCB ASS'Yの半固定抵抗 R20 (図2-1)調整する。
10. 次に、テープ・スピードをLOW にし、テスト・テープ MTT-111Nを再生して、同様に半固定抵抗 R22 (図2-1)を調整する。

#### 4-7. ワウ・フラッタ

注意：測定は再生法により、テープの巻き始め、中間部、巻き終わりでそれぞれ行なってください。（但し、ハーフの巻き始めと巻き終わりの1目盛りを除く。また15秒に1回のピーク値は判定外とする。）

1. 図4-4 の様にワウ・フラッタ・メータをデッキに接続する。
2. テスト・テープまたは、相当品を装填し再生する。
3. ワウ・フラッタ値を測定する。規格は下記の通りです。  
 HIGH SPEED : 0.04%WRMS以下 (聴感補正值)  
 LOW SPEED : 0.06%WRMS以下 (聴感補正值)

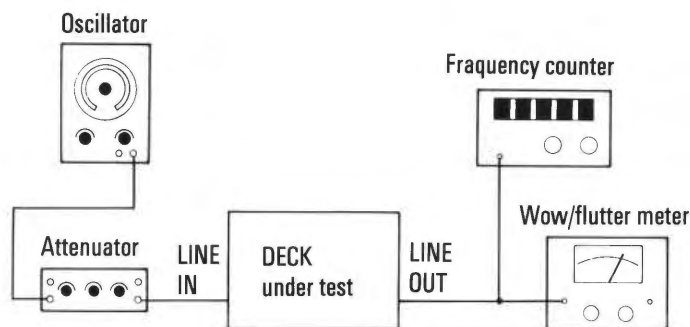


Fig. 4-4

図4-4

## 5. CHECKING OF SIGNALS IN MIXER SECTION AND SETTINGS OF CONTROLS/SWITCHES AND FADER CONTROLS

ミキサー部の信号チェックと各つまみ、フェーダ、ノブのセット

### 5-1. AUX-1 MASTER CONTROLS (INSERT JACK → AUX-1 OUT JACK: Figure 5-1)

1. Set one of the AUX-1 controls at the PRE position and the AUX MASTER-1 control at the maximum (full clockwise) position.
2. Make sure that when the 1 kHz -10 dBV signal is input to the INSERT jack for the same channel selected in the Step 1 above, the output level at the AUX-1 OUT jack will be  $-2 \text{ dBV} \pm 1 \text{ dB}$ .
3. Slowly rotate the AUX-1 MASTER control counterclockwise to decrease the output level and stop rotating the control at  $-10 \text{ dBV}$  output. At this point, ensure that the AUX-1 MASTER control is set between 2 and 3 o'clock positions.
4. Set all the AUX-1 controls at the PRE position and confirm that the output level for each channel at the AUX-1 OUT jack will be  $-10 \text{ dBV} \pm 1 \text{ dB}$  when the 1 kHz,  $-10 \text{ dBV}$  signal is input to the respective INSERT jacks.

### 5-2. INPUT FADER CONTROLS (INSERT JACK → AUX-1 OUT JACK: Figure 5-1)

1. Place the unit in the status (AUX-1 MASTER control is set) as described in the Step 3 of Section 5-1 and confirm the output level at the AUX-1 OUT jack will be  $-2 \text{ dBV} \pm 1 \text{ dB}$  when an AUX-1 control is set to the POST position and the Input Fader control for the same channel is set at the maximum position.
2. Gradually slide down the same Input Fader control to the point where the output level at the AUX-1 OUT jack becomes  $-10 \text{ dBV}$ . By maintaining this state, make sure that the Input Fader control is positioned at the dark shade area (between "7" and "8").
3. In the same manner, adjust all other Input Fader controls.

### 5-1. AUX 1 MASTERつまみ (INSERT--->AUX 1 OUT : Fig.5-1)

1. AUX 1 つまみをPRE , AUX 1 MASTERつまみを最大にセットする。
2. INSERTに 1kHz, -10dBVを入力したとき, AUX 1 OUT の出力レベルが  $-2\text{dBV} \pm 1\text{dB}$  であることを確認する。
3. 次に AUX 1 MASTER を少しずつ絞っていき, 出力が  $-10\text{dBV}$  になるようにセットする。このとき, AUX 1 MASTERが 2 ~ 3 時の位置にあることを確認する。
4. 全ch, AUX 1 つまみをPRE にセットして, それぞれINSERTに1kHz, -10dBV を入力したとき AUX 1 OUTの出力が  $-10\text{dBV} \pm 1\text{dB}$  であることを確認する。

### 5-2. INPUT フェーダー (INSERT--->AUX 1 OUT : Fig.5-1)

1. 5-1 項ステップ 3 (AUX 1 MASTER がセットされた状態) で, AUX 1 つまみを POST , INPUT フェーダーを最大にセットしたとき, AUX 1 OUT の出力レベルが,  $-2\text{dBV} \pm 1\text{dB}$  であることを確認する。
2. 次に INPUTフェーダーを少しずつ絞っていき, 出力が  $-10\text{dBV}$  になるようにセットする。このとき, INPUT フェーダーが網目(7~8 目盛り)の位置にあることを確認する。
3. 同様に全ch, INPUT フェーダーのセットを行う。

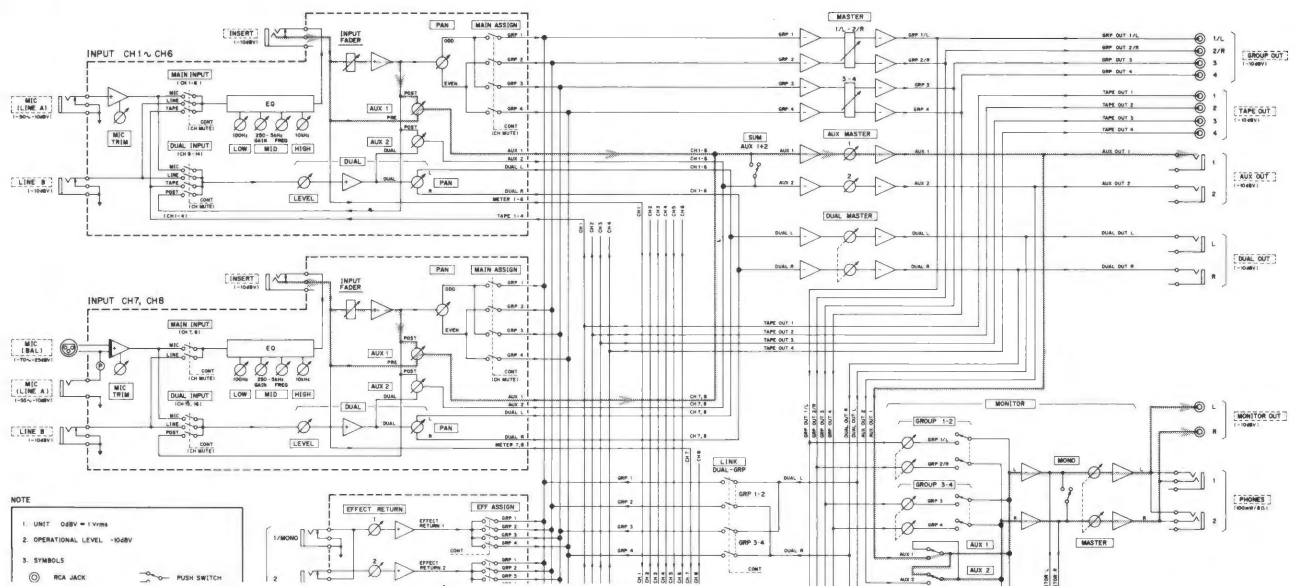


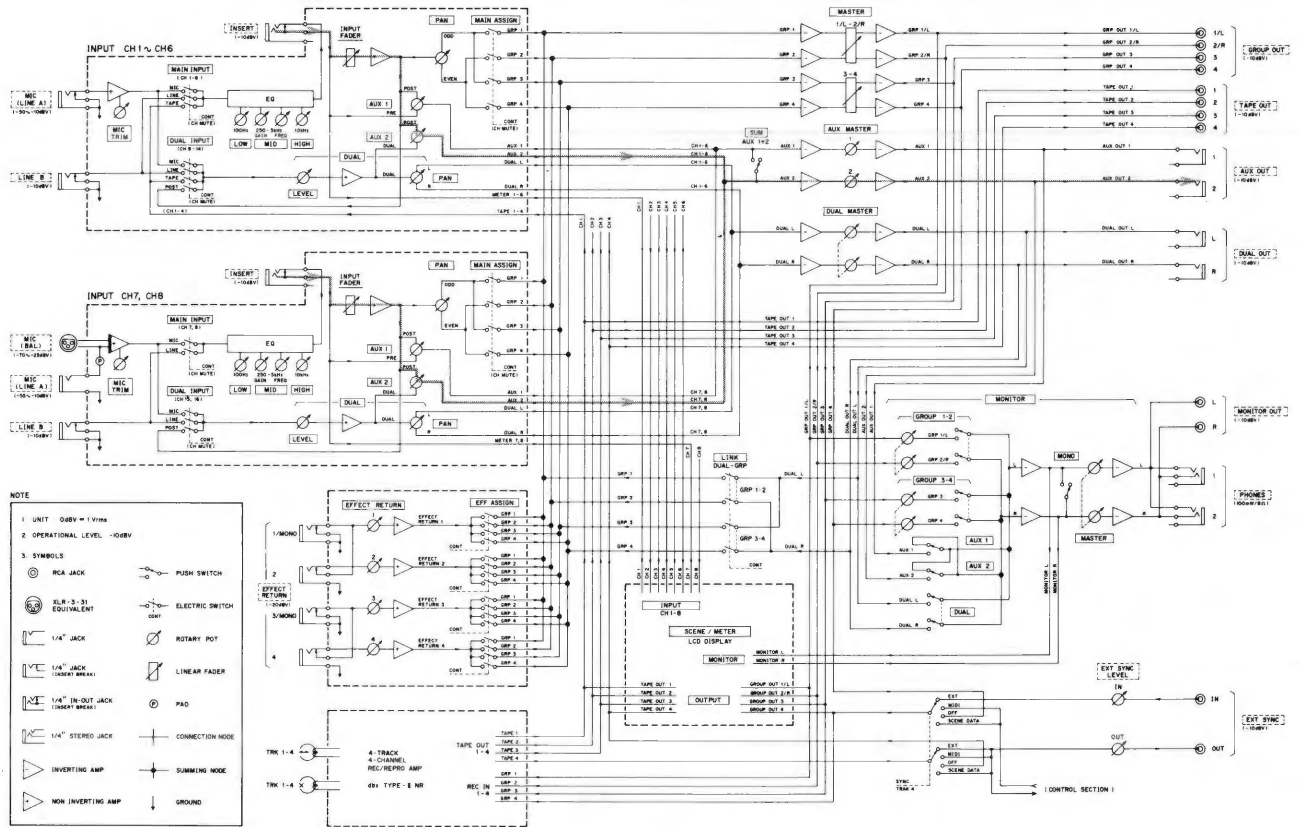
Fig. 5-1 / 5-1 - 13 -

**5-3. AUX-2 MASTER CONTROLS (INSERT JACK → AUX-2 OUT JACK: Figure 5-2)**

1. By keeping the status (the INPUT Fader controls are set) as described in the Section 5-2, place one of the AUX-2 controls at the POST position and the AUX-2 MASTER control at the maximum (full clockwise) position. Then confirm that the output level at the AUX-2 OUT jack is  $-2\text{ dBV} \pm 1\text{ dB}$ .
2. Gradually rotate the AUX-2 MASTER control counterclockwise to the point where the output level becomes  $-10\text{ dBV}$ , and make sure the AUX-2 MASTER control is set between 2 and 3 o'clock positions.
3. Place all other AUX 2 controls at the POST position and check the output level at the AUX-2 OUT jacks for all channels. The output level should be  $-10\text{ dBV} \pm 1\text{ dB}$  for every channel.

**5 - 3 . AUX 2 MASTERつまみ (INSERT--->AUX 2 OUT : Fig.5-2)**

1. 5-2項(INPUTフェーダーがセットされた状態)で、AUX 2つまみをPOST、AUX 2 MASTERつまみを最大にセットしたとき、AUX 2 OUT の出力レベルが、 $-2\text{dBV} \pm 1\text{dB}$ であることを確認する。
2. 次にAUX 2 MASTERを少しずつ絞っていき、出力が $-10\text{dBV}$ になるようにセットする。このとき、AUX 2 MASTERが2~3時の位置にあることを確認する。
3. 全ch、AUX 2つまみをPOSTにセットして、それぞれAUX 2 OUTの出力を確認する。このとき、出力レベルは $-10\text{dBV} \pm 1\text{dB}$ であること。



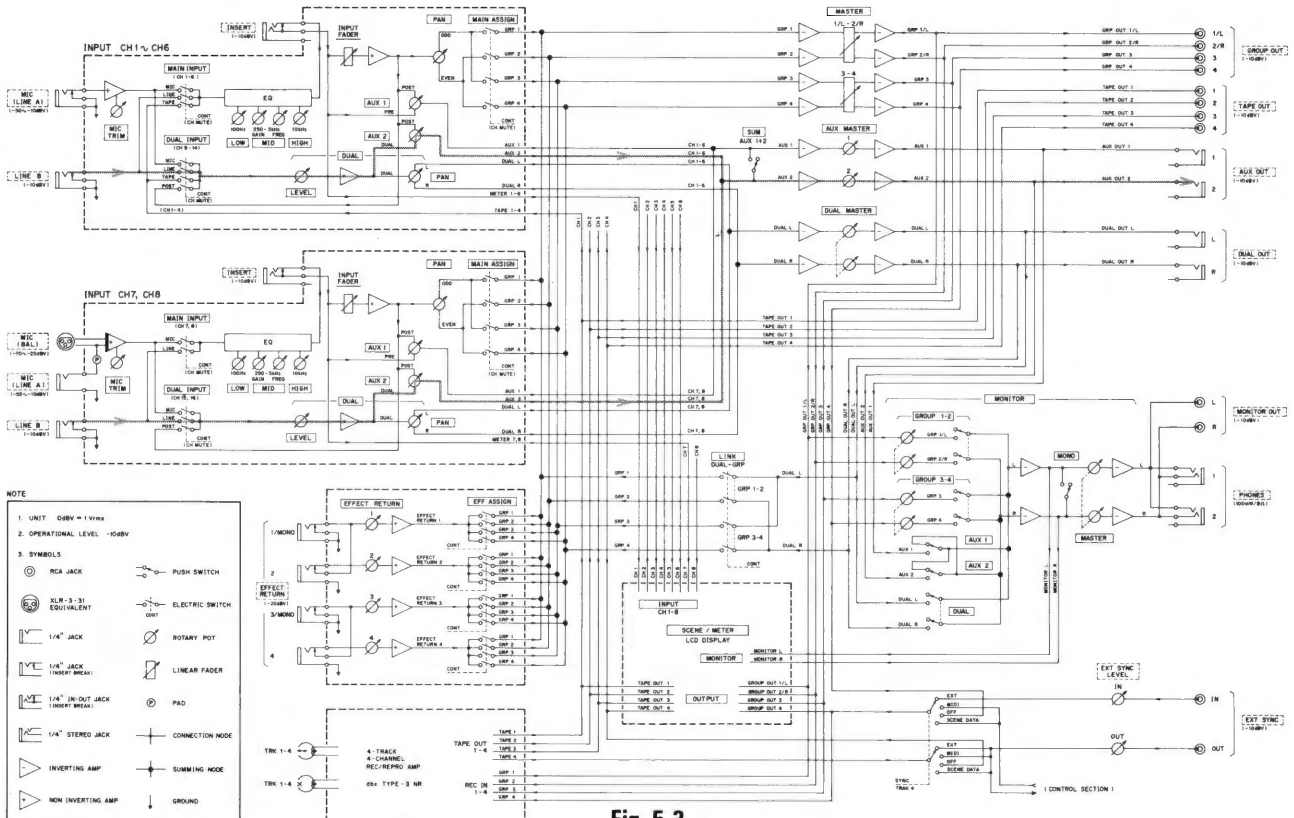
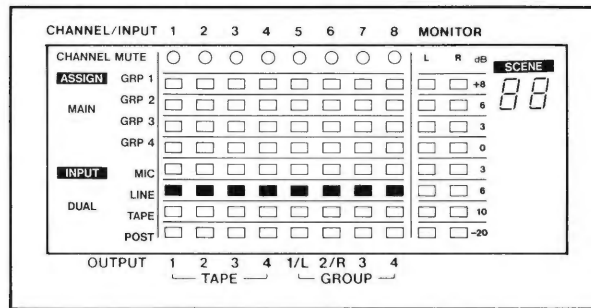
**Fig. 5-2**  
 □ 5-2

**5-4. DUAL LEVEL CONTROLS (LINE INPUT JACK → AUX-2 OUT JACK: Figure 5-3)**

1. Keep the status (the AUX-2 MASTER control is set) as specified in the Section 5-3 and set one of the AUX-2 controls at the DUAL position and the DUAL LEVEL control for the same channel as the AUX-2 control at the maximum position then set up the INPUT as indicated in the illustration.
2. Ensure that when 1 kHz -10 dBV is fed to the LINE INPUT jack, the output level at the AUX-2 OUT jack becomes -2 dBV ± 1 dB.
3. Slowly decrease the output level by revolving the DUAL LEVEL control and set it at -10 dBV output. At this point, confirm that the DUAL LEVEL control is positioned between 2 and 3 o'clock positions.
4. Adjust and set the DUAL LEVEL controls for all other channels by repeating the above procedures.

**5 - 4 . DUAL LEVELつまみ (LINE IN--->AUX 2 OUT : Fig.5-3)**

1. 5-3項(AUX 2 MASTER がセットされた状態)で、AUX 2 つまみをDUAL、DUAL LEVELつまみを最大にセットし、INPUTを図の様に設定する。
2. LINE IN に 1kHz,-10dBVを入力したとき、AUX 2 OUT の出力レベルが -2dBV±1dBであることを確認する。
3. 次に DUAL LEVEL を少しずつ絞っていき、出力が -10dBVになるようにセットする。このときDUAL LEVELが2～3時の位置にあることを確認する。
4. 同様に全ch、DUAL LEVELのセットを行う。



**Fig. 5-3**

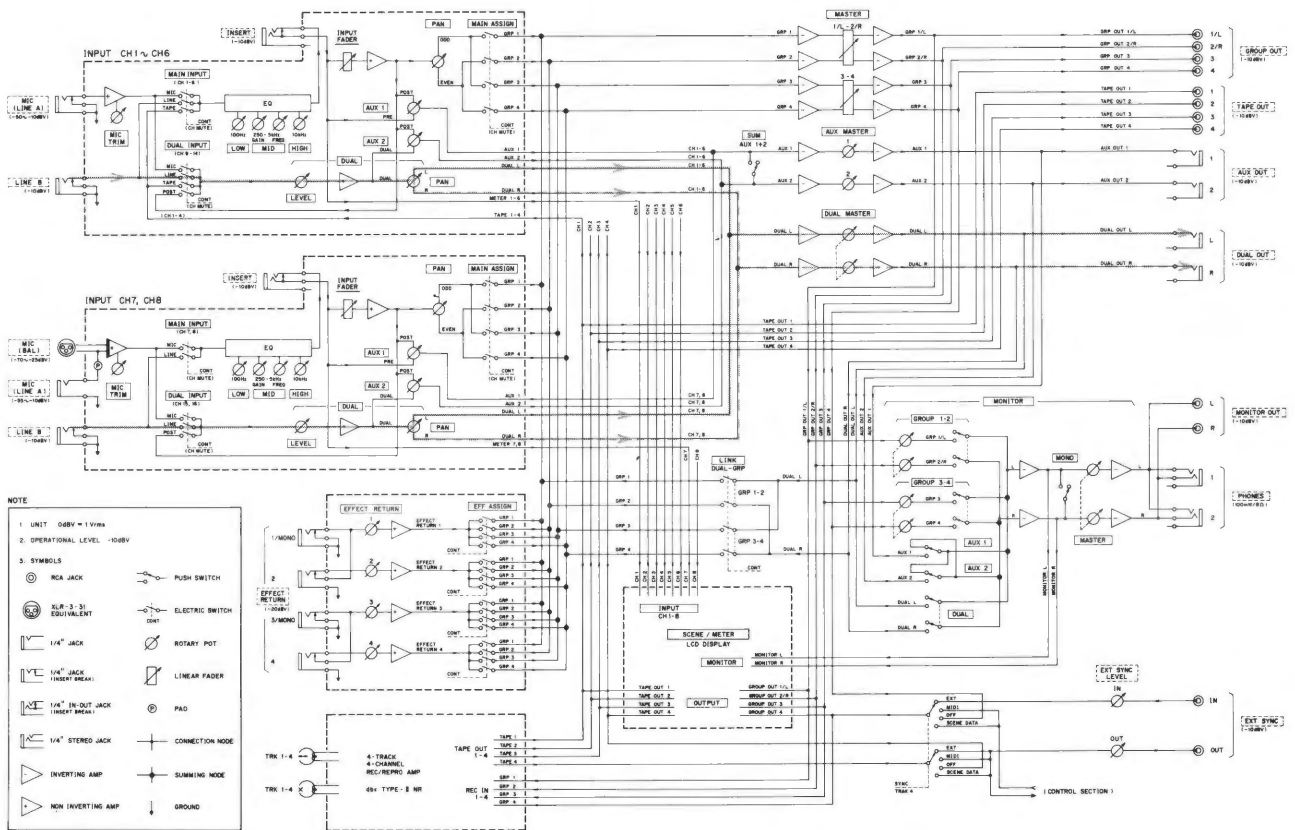
5-3

**5-5. DUAL MASTER CONTROL (LINE INPUT JACK → DUAL OUT JACK: Figure 5-4)**

1. Place the unit in the status (the DUAL LEVEL controls are set) as mentioned in the previous Section 5-4 and set a DUAL PAN control to the "L" position then set the DUAL MASTER control at the maximum position. Under this condition, make sure that the output level at the DUAL (L) OUT jack is  $-2\text{ dBV} \pm 1\text{ dB}$ .
2. Slowly lower the output level by rotating the DUAL MASTER control and set the output level at  $-10\text{ dBV}$ . At this point, ensure the DUAL MASTER control is positioned between 2 and 3 o'clock positions.
3. Set the DUAL PAN controls for all channels to the "L" position and check the output level at the DUAL (L) OUT jack for each channel. The output level should be  $-10\text{ dBV} \pm 1\text{ dB}$ .
4. Place the DUAL PAN controls for all channels to the "R" position and ensure the output at every DUAL (R) OUT jack is  $-10\text{ dBV} \pm 1\text{ dB}$  for each channel. Also make sure that the output level at each DUAL OUT jack is  $-12\text{ dBV} \pm 1\text{ dB}$  when the DUAL PAN controls are set at their center position.

**5 - 5 . DUAL MASTER つまみ (LINE IN--->DUAL OUT : Fig.5-4)**

1. 5-4項(DUAL LEVEL がセットされた状態)で DUAL PAN をL側に, DUAL MASTER つまみを最大にセットしたとき, DUAL(L) OUT の出力レベルが,  $-2\text{dBV} \pm 1\text{dB}$ であることを確認する.
2. 次に DUAL MASTER つまみを少しずつ絞っていき, 出力が  $-10\text{dBV}$ になるようにセットする. このとき, DUAL MASTER が 2~3 時の位置にあることを確認する.
3. 全ch, DUAL PANをL側にセットして, それぞれDUAL(L) OUT の出力を確認する. このとき, 出力レベルは  $-10\text{dBV} \pm 1\text{dB}$  であること.
4. 次に DUAL PAN をR側にセットして, 同様にDUAL(R) OUT に  $-10\text{dBV} \pm 1\text{dB}$  が出力されることを確認する. また, DUAL PANをセンターにセットしたとき DUAL OUT の出力レベルが  $-12\text{dBV} \pm 1\text{dB}$  であることを確認する.



**Fig. 5-4**

☒ 5-4



5-6. GROUP MASTER FADER CONTROLS (LINE IN JACK → GROUP OUT JACK: Figure 5-5)

- Put the unit in the status (the INPUT Fader controls are set) as stated in the section 5-2 and place a Main PAN control to the ODD position, the GROUP 1/L-2/R MASTER Fader control at the maximum position (labeled "10"), and the EQ control on the same channel at its center position, then set up the ASSIGN, INPUT as shown in each illustration.
- Make sure that when the 1 kHz -10 dBV signal is input to the LINE INPUT jack on the same channel as the Main PAN control, the output level at the GROUP-1 OUT jack will be -2 dBV ± 1 dB.
- Slide down slowly the GROUP 1/L-2/R MASTER Fader control and set at the point where the output level becomes -10 dBV. At this point, confirm that the GROUP 1/L-2/R MASTER Fader control is set at the dark shade area (between "7" and "8").
- Adjust the GROUP 3-4 MASTER Fader control by following the above procedure.
- Set the Main PAN controls for all channels at the ODD position and confirm the output level at the GROUP-1 OUT jack for each channel is -10 dBV ± 1 dB. Also confirm the output level at the GROUP-3 OUT jack is -10 dBV ± 1 dB.
- Place the Main PAN controls for all channels at the EVEN position and confirm the output level at the GROUP-2 OUT jack is -10 dBV ± 1 dB. Also confirm the output level at the GROUP-4 OUT jack is -10 dBV ± 1 dB. Next, place the Main PAN controls for all channels at their center position and make sure the output level at the GROUP OUT jacks is -12 dBV ± 1 dB.

5-6. GRP MASTERフェーダー  
(LINE IN→GROUP OUT : Fig.5-5)

- 5-2項(INPUTフェーダーがセットされた状態)で MAIN PAN をODD, GRP 1/L-2/R MASTERフェーダーを最大, EQつまみをセンターにセットし, ASSIGN, INPUTをそれぞれ図の様を設定する.
- LINE INに 1kHz, -10dBVを入力したとき, GRP 1 OUT の出力レベルが -2dBV±1dB であることを確認する.
- 次に GRP 1/L-2/R MASTER フェーダーを少しずつ絞っていくとき, 出力が -10dBV になるようにセットする. このとき GRP 1/L-2/R MASTER が, 網目(7~8 目盛り)の位置にあることを確認する.
- 同様に GRP 3-4 MASTER フェーダーをセットする.
- 全ch, MAIN PANをODD にセットして, それぞれ GRP 1 OUT の出力を確認する. このとき, 出力レベルは -10dBV ±1dB であること. 同様にGRP 3 OUT の出力も確認する.
- 次に MAIN PAN を全ch, EVENにセットして, それぞれ GRP 2 OUTに -10dBV ±1dB が出力されることを確認する. 同様に GRP 4 OUTの出力も確認する.  
また, MAIN PANをセンターにセットしたときGRP OUT の出力レベルが -12dBV ±1dB であることを確認する.

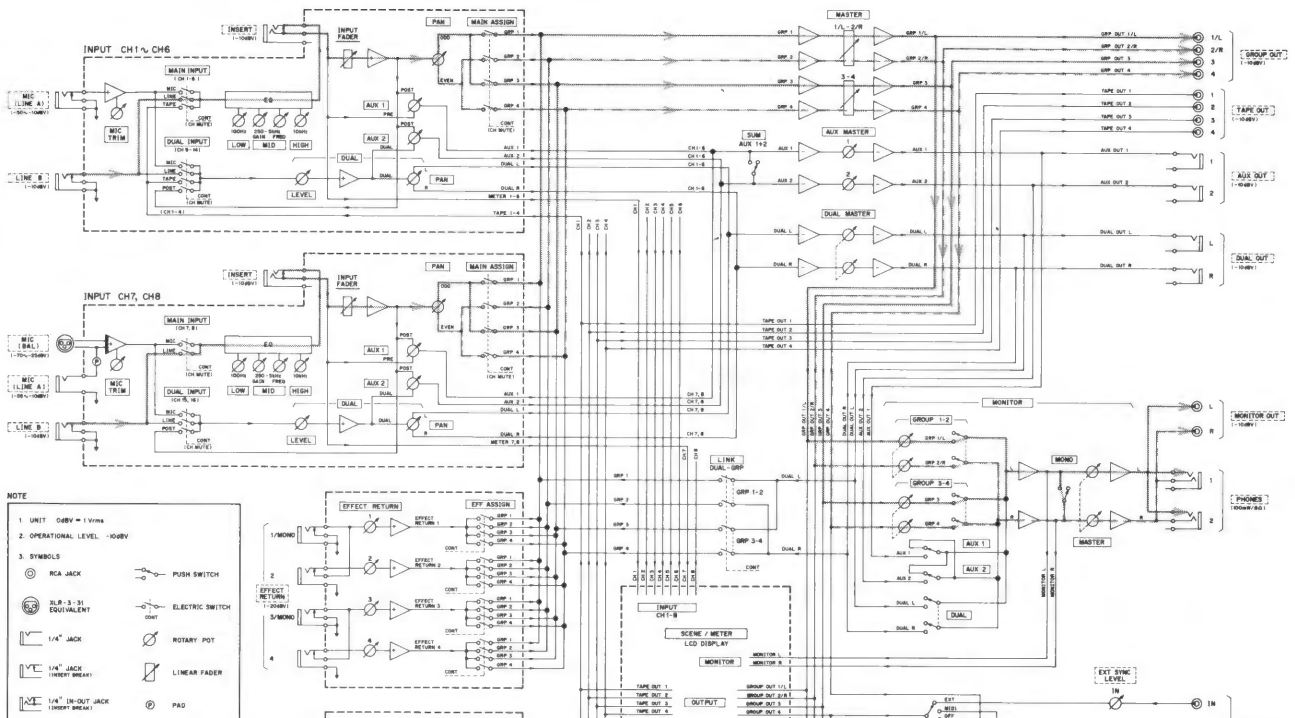
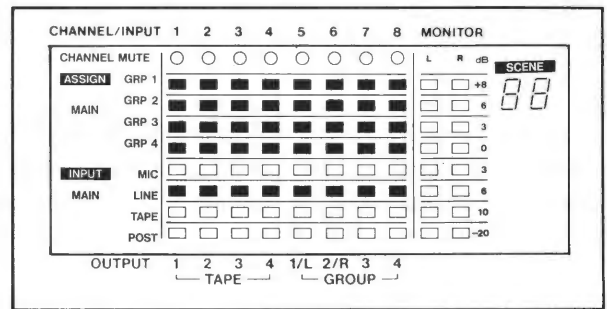


Fig. 5-5

図5-5

### 5-7. MONITOR MASTER CONTROL (INSERT JACK — → MONITOR OUT JACK: Figure 5-1)

1. Put the unit in the state (the AUX-1 MASTER control is set) as indicated in the Section 5-1 and turn the AUX-1 switch on and then set the MONITOR MASTER control at the maximum position. Keep this status and check to see if the output level at the MONITOR OUT jacks is  $-2 \text{ dBV} \pm 1 \text{ dB}$ .
2. Rotate gradually the MONITOR MASTER control to obtain the output level of  $-10 \text{ dBV}$  at the MONITOR OUT jack and confirm the MONITOR MASTER control is set between 2 and 3 o'clock positions.

### 5-8. MONITOR GROUP 1-2 (3-4) SWITCHES AND MONO SWITCH (LINE INPUT JACK → MONITOR OUT JACK: Figure 5-5)

1. Put the unit in the status (the GROUP MASTER Fader control is positioned) as described in the Step 4 of the Section 5-6 and set the MONITOR MASTER control as mentioned in the Step 2 of Section 5-7. Then, turn the GROUP 1-2 switch on and set the MONITOR GROUP 1-2 control at the maximum position and make sure the output level at the MONITOR-L OUT jack is  $-2 \text{ dBV} \pm 1 \text{ dB}$ .
2. Gradually decrease the output level by rotating the MONITOR GROUP 1-2 control until you get  $-10 \text{ dBV}$  output. At this point, confirm the MONITOR GROUP 1-2 control is set between 2 and 3 o'clock positions.
3. Adjust and set the MONITOR GROUP 3-4 control by following the above procedure and confirm the setting position.
4. Position the Main PAN control at the EVEN position and confirm that  $-10 \text{ dBV} \pm 1 \text{ dB}$  is output at the MONITOR-R OUT jack.
5. Maintain the status of the Step 4 above and turn on the MONO switch. Confirm that  $-16 \text{ dBV} \pm 1 \text{ dB}$  is output at the MONITOR OUT (L and R) jacks and the difference between L-channel and R-channel is within  $0.5 \text{ dB}$ .

### 5-9. HEADPHONE MONITOR LINE IN → PHONES OUT: Figure 5-5

Place the unit in the status ( $-10 \text{ dBV}$  is being output at the MONITOR OUT jacks) as described in the Step 4 of Section 5-8 and confirm that  $20 \text{ mW}$  ( $-8 \text{ dBV}$ ) with  $8\text{-ohm}$  impedance is output at the PHONES 1 and 2 jacks.

### 5-7. MONITOR MASTERつまみ (INSERT--->MONITOR OUT : Fig.5-1)

1. 5-1項(AUX 1 MASTER がセットされている状態)で, AUX 1 スイッチをオン, MONITOR MASTER つまみを最大にセットしたとき, MONITOR OUT の出力レベルが  $-2\text{dBV} \pm 1\text{dB}$ であることを確認する.
2. 次に MONITOR MASTER つまみを少しずつ絞っていき, 出力が  $-10\text{dBV}$  になるようにセットする. このとき, MONITOR MASTERが 2~3 時の位置にあることを確認する.

### 5-8. MONITOR GRP 1-2(3-4) つまみ, MONOスイッチ (LINE IN--->MONITOR OUT : Fig.5-5)

1. 5-6項ステップ4(GRP MASTER フェーダーがセットされている状態)で, MONITOR MASTERつまみがセットされたとき, GROUP 1-2 スイッチをオン, MONITOR GRP 1-2 つまみを最大にセットし, MONITOR L OUT の出力レベルが  $-2\text{dBV} \pm 1\text{dB}$ であることを確認する.
2. 次に MONITOR GRP 1-2 つまみを少しずつ絞っていき, 出力が  $-10\text{dBV}$  になるようにセットする. このとき, MONITOR R GRP 1-2 つまみが 2~3 時の位置にあることを確認する.
3. 同様に MONITOR GRP 3-4 つまみのセット及び確認を行う.
4. 次に MAIN PAN をEVENにセットして, MONITOR R OUT に  $-10\text{dBV} \pm 1\text{dB}$  が出力されることを確認する.
5. ステップ4の状態でMONOスイッチをオンにしたとき, MONITOR(L,R) OUTに  $-16\text{dBV} \pm 1\text{dB}$  が出力されることを確認する. L,R の差は  $0.5\text{dB}$ 以内であることを.

### 5-9. ヘッドホン・モニター (LINE IN--->PHONES OUT : Fig.5-5)

5-8項ステップ4(MONITOR OUTに  $-10\text{dBV}$  が出力されている状態)でPHONES OUTに,  $8 \Omega$  負荷で  $20\text{mW}$ ( $-8\text{dBV}$ )が出力されることを確認する.

**5-10. EFFECT RETURN CONTROLS (EFFECT RETURN JACK → GROUP OUT JACK: Figure 5-6)**

1. Place the unit under the conditions (the GROUP MASTER Fader control is set) as mentioned in the Section 5-6 above then set the EFFECT RETURN-1 control at the maximum (full clockwise) position, the EFFECT RETURN controls (2 through 4) at the minimum (full counterclockwise) position, and the ASSIGN switches at the positions specified in the table.
2. Make sure that when the 1 kHz, -10 dBV signal is fed to the EFFECT RETURN-1 INPUT jack, +3 dBV ± 1 dB will be output at the GROUP-1 OUT jack.
3. Then, slowly turn the EFFECT RETURN-1 control clockwise to decrease the output and set it at -10 dBV output. Confirm the EFFECT RETURN-1 control is positioned between 1 and 2 o'clock positions.
4. Confirm other EFFECT RETURN controls 2 through 4 in the same manner.

**Note:** When performing adjustment on a channel, be sure to set the EFFECT RETURN controls for all other channels at the minimum position.

**5-10. EFFECT RETURN つまみ (EFF RTN--->GROUP OUT : Fig.5-6)**

1. 5-6項(GROUP MASTER フェーダーがセットされている状態)で、EFFECT RETURN 1 つまみを最大に、EFFECT RETURN 2~4 つまみを最少にセットし、ASSIGNを図の様に設定する。
2. EFFECT RETURN 1 INPUT に 1kHz、-10dBVを入力したとき、GROUP 1 OUT に +3dBV±1dB が出力されることを確認する。
3. 次に EFFECT RETURN 1 つまみを少しずつ絞っていき、出力が -10dBV になるようにセットする。このとき、EFFECT RETURN 1 つまみが1~2時の位置にあることを確認する。
4. 同様に EFFECT RETURN 2~4 つまみを確認する。  
注. 確認するch以外のつまみは必ず最少に絞っておくこと。

| CHANNEL/INPUT |       | 1    | 2 | 3   | 4 | 5       | 6 | 7   | 8 | MONITOR |     |    |
|---------------|-------|------|---|-----|---|---------|---|-----|---|---------|-----|----|
| CHANNEL MUTE  |       | ○    | ○ | ○   | ○ | ○       | ○ | ○   | ○ | L       | R   | dB |
| ASSIGN        | GRP 1 | ■    | ■ | ■   | ■ | □       | □ | □   | □ | +       | 8   | 00 |
|               | GRP 2 | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 0   |    |
|               | GRP 3 | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 0   |    |
|               | GRP 4 | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 0   |    |
| INPUT         | MIC   | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 3   |    |
|               | MAIN  | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 6   |    |
|               | LINE  | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 6   |    |
|               | TAPE  | □    | □ | □   | □ | □       | □ | □   | □ | 0       | 10  |    |
|               | POST  | □    | □ | □   | □ | □       | □ | □   | □ | 0       | -20 |    |
| OUTPUT        |       | 1 2  |   | 3 4 |   | 1/L 2/R |   | 3 4 |   |         |     |    |
|               |       | TAPE |   |     |   | GROUP   |   |     |   |         |     |    |

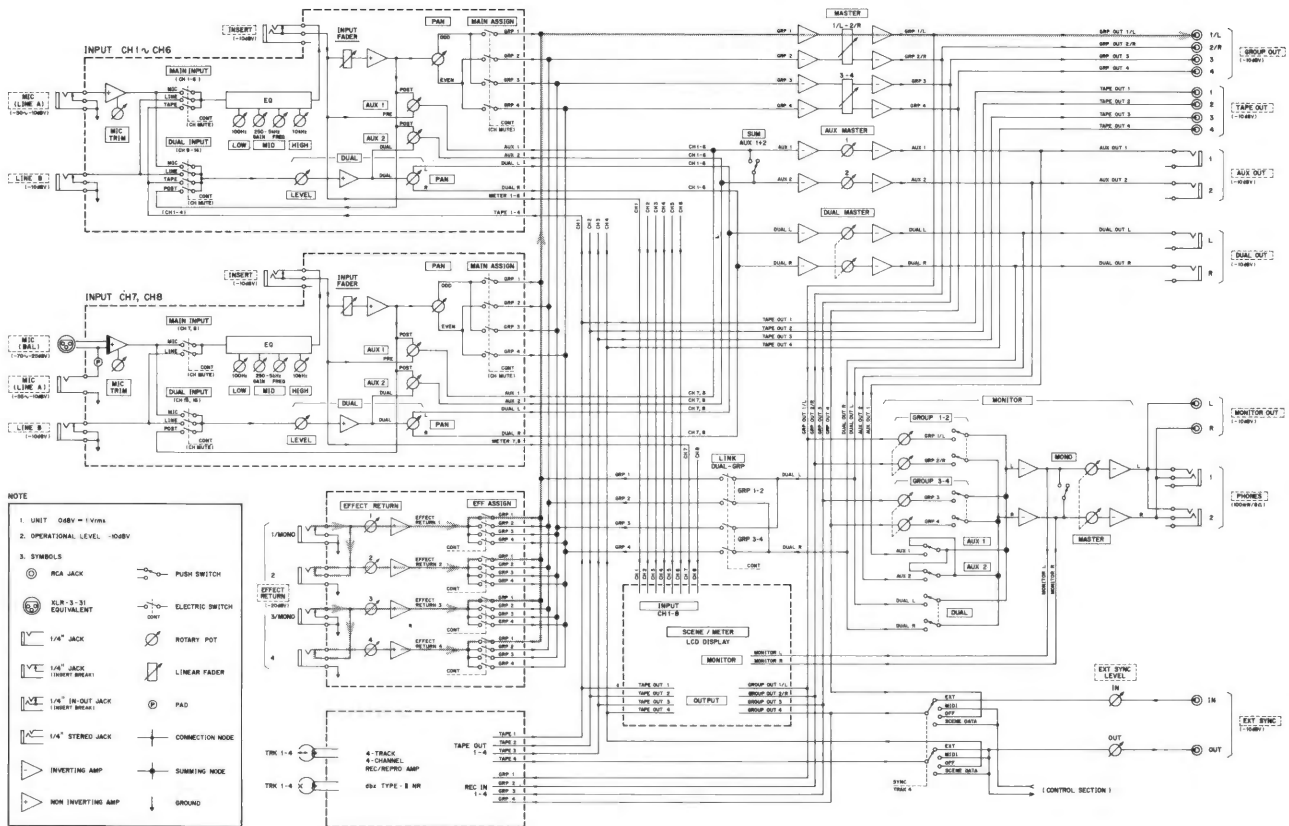


Fig. 5-6

☒ 5-6

5-11. MIC TRIM (MIC INPUT JACK → INSERT JACK: Figure 5-7)

1. Place the MIC TRIM controls at the minimum position and the EQ controls at their center position and then set the INPUT as shown in the illustration.
2. Confirm that when the 1 kHz -10 dBV signal is input to the MIC INPUT jack, -10 dBV ± 1 dB will be output at the INSERT OUT jack.
3. Place the MIC TRIM controls at the maximum position and input -50 dBV to the MIC INPUT jacks (for the channels 7 and 8, input -70 dBV with a 1/4" jack, -55 dBV XLR connector) then confirm that -10 dBV ± 2 dB will be output at the INSERT OUT jack.

5-11. MIC TRIM (MIC IN → INSERT : Fig.5-7)

1. MIC TRIMを最少, EQつまみをセンターにセットし, INPUTを図の様に設定する.
2. MIC INに 1kHz, -10dBVを入力したとき, INSERT OUTに -10dBV ± 1dB が出力されることを確認する.
3. 次に MIC TRIM を最大にセットし, MIC INに -50dBV(7.8ch は, 1/4" JACKで -55dBV, XLR コネクターで -70dBV)を入力したとき, INSERT OUTに -10dBV ± 2dB が出力されることを確認する.

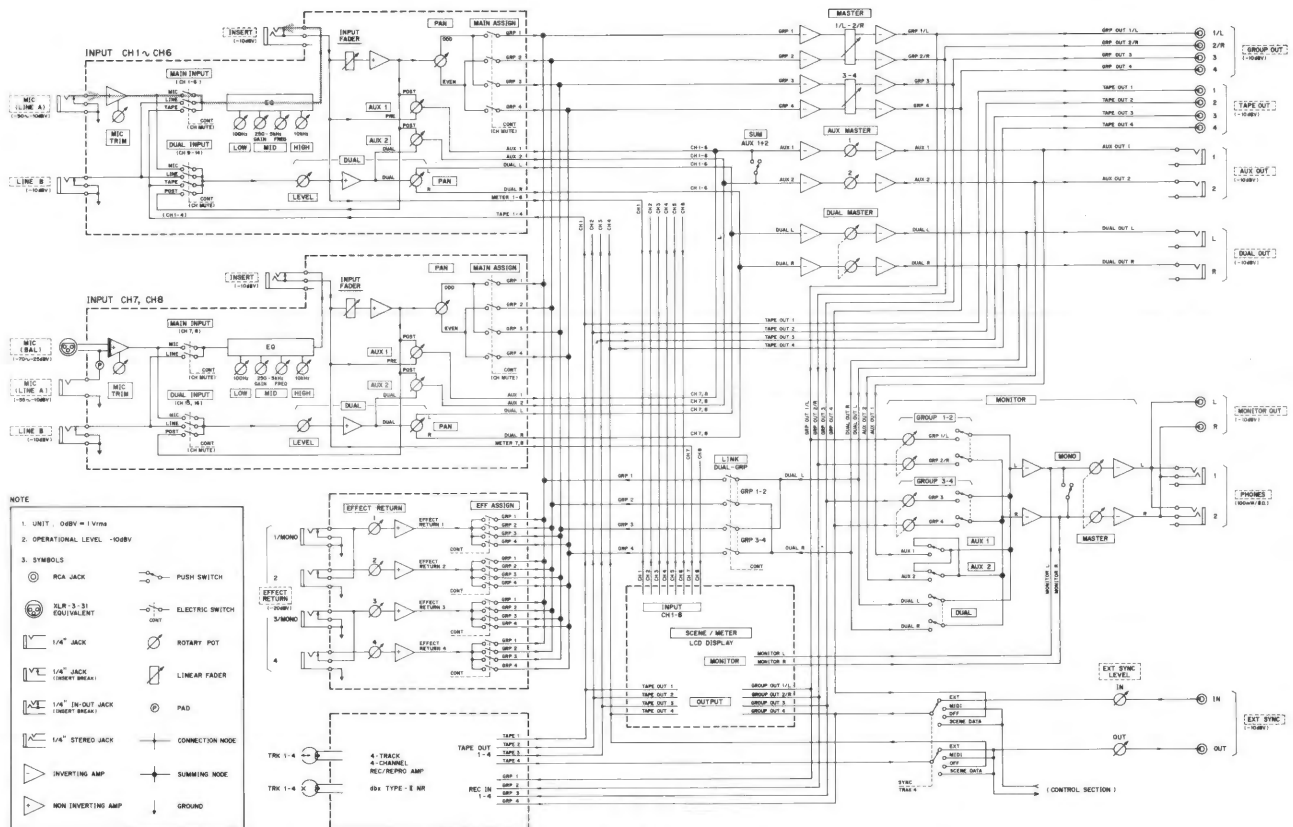
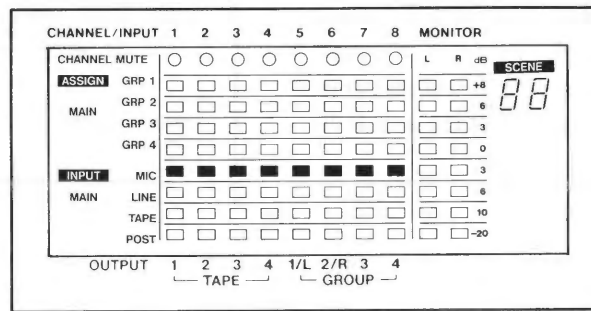


Fig. 5-7  
図5-7

## 5-12. LINK DUAL-GROUP SWITCH (LINE INPUT JACK → GROUP OUT JACK: Figure 5-8)

- Put the unit in the status specified in the Section 5-5 (the DUAL LEVEL and DUAL MASTER controls are being set) and set the GROUP MASTER Fader control per the Section 5-6. Set both of the ASSIGN MAIN switches to the OFF position, the LINK DUAL-GROUP 1-2 switch to the ON position, and the DUAL PAN controls to the "L" position, then confirm the unit will output  $-10 \text{ dBV} \pm 1 \text{ dB}$  at the GROUP OUT-1 jack.
- Next, place the DUAL PAN controls to the "R" position and confirm that  $-10 \text{ dBV} \pm 1 \text{ dB}$  will be output at the GROUP OUT-2 jack.
- Also confirm  $-10 \text{ dBV} \pm 1 \text{ dB}$  will be output at the GROUP OUT-3 and -4 jacks.

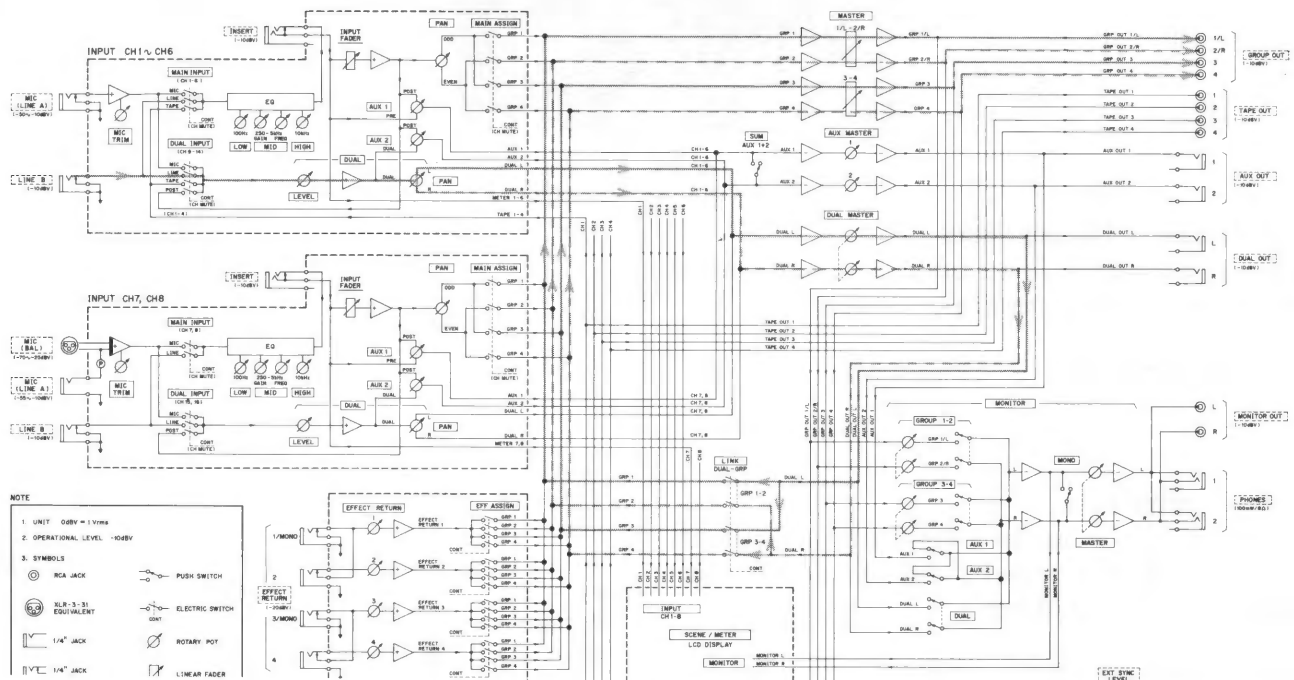


Fig. 5-8  
5-8

## 5-13 EQ (Hi.Lo) Controls (LINE IN → GROUP OUT: Figure 5-5)

Maintain the status (the standard level signal is being output at the GROUP OUT terminals) as mentioned in the section 5-6 and verify that when the input signal frequency and each EQ control is set at their maximum positions and minimum positions, the output level at the GROUP OUT terminals changes as follows based on the frequency 1 kHz.

High (10 kHz):  $\pm 12 \pm 1.5 \text{ dB}$   
 Mid (250 Hz to 5 kHz):  $\pm 14 \pm 1.5 \text{ dB}$   
 Low (100 Hz):  $\pm 12 \pm 1.5 \text{ dB}$

## 5-12. LINK DUAL-GRP スイッチ (LINE IN → GROUP OUT : Fig.5-8)

- 5-5項(DUAL LEVEL, DUAL MASTER がセットされている状態)で, GRP MASTERフェーダーがセットされているとき, MAIN ASSIGN をALL OFF, LINK DUAL-GRP 1-2 スイッチをON, DUAL PAN をL側にセットし, GRP 1 OUT に  $-10 \text{ dBV} \pm 1 \text{ dB}$  が出力されることを確認する.
- 次に DUAL PAN をR側にセットして, GRP 2 OUT に  $-10 \text{ dBV} \pm 1 \text{ dB}$  が出力されることを確認する.
- 同様に GRP 3-4 OUTを確認する.

## 5-13. EQ(Hi,Lo) つまみ (LINE IN → GROUP OUT : Fig.5-5)

5-6項(GROUP OUTに基準レベルが出力されている状態)で入力信号の周波数と各EQつまみを最大, 最少にセットしたとき, GROUP OUT の出力レベルが周波数 1kHz を基準にして次の通り変化することを確認する.

HIGH(10kHz) :  $\pm 12 \pm 1.5 \text{ dB}$   
 MID(250 ~ 5kHz) :  $\pm 14 \pm 1.5 \text{ dB}$   
 LOW(100Hz) :  $\pm 12 \pm 1.5 \text{ dB}$

### 5-14. LCD Level Meter

The LCD level meter should indicate 0 dB in the specified input/output state.

Adjustment: Connect a DC voltmeter between Pin No. 2 of R402 (Figure 5-9) on the ASN CONT PCB assembly and GND terminal then adjust R402 so that the DC meter shows 3.8V.

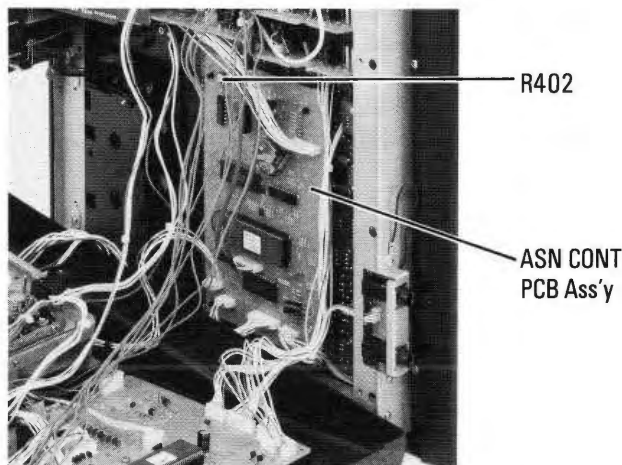


Fig. 5-9

図5-9

### 5-15. Frequency Characteristics

When a standard signal is input to each input terminal, the output frequency characteristics should be:

20 Hz — 20 kHz +1 dB  
-3 dB

### 5-16. Distortion Rate

Measure the distortion rate after setting the input/output controls for each channel at the standard positions and the 1 kHz input signal is set at the specified level.

Connect a 30 kHz low-pass filter between the output terminal and the distortion rate meter.

The specifications are as follows:

MIC IN to GROUP OUT: less than 0.04%  
LINE IN to GROUP OUT: less than 0.035%

### 5-17. Signal-to-Noise Ratio

Take measurements after setting the input/output controls for each channel at the specified positions. The specifications are shown below.

DIN AUDIO (20 Hz — 20 kHz)

1 MIC IN to GROUP OUT: less than 71 dB  
8 MIC INS to GROUP OUT: less than 69 dB  
1 LINE IN to GROUP OUT: less than 74 dB  
8 LINE INS to GROUP OUT: less than 72 dB

### 5-14. LCDメータ・レベル

規定入出力状態でLCDメータ・レベルが0dBを指示していること。

調整: ASN CONT PCB Ass'yのR402(図5-9)の2番端子とGND間にDCボルト・メータを接続し、DCメータの値が3.8VになるようにR402を調整する。

### 5-15. 周波数特性

基準入力、出力レベルに於いて、いずれのINPUTからOUTPUTの周波数特性は下記の通りです。

20Hz~20kHz +1dB  
-3dB

### 5-16. 歪率

各系統の入出力つまみが基準位置にセットされ、入力信号が1kHzで規定レベルにセットされた状態で測定します。

出力側には歪率計との間に30kHzのロー・パス・フィルタを接続します。規格は次の通りです。

1 MIC--->GROUP OUT : 0.04%以下  
1 LINE--->GROUP OUT : 0.035%以下

### 5-17. SN比

各系統入出力つまみが規定位置にセットされた状態で測定します。規格は次の通りです。

DIN AUDIO(20Hz-20kHz)

1 MIC--->GROUP OUT : 71dB以下  
8 MIC--->GROUP OUT : 69dB以下  
1 LINE--->GROUP OUT : 74dB以下  
8 LINE--->GROUP OUT : 72dB以下

## 6. CHECKS AND ADJUSTMENTS ON RECORDING/PLAYBACK AMP

録音・再生アンプ部のチェックと調整

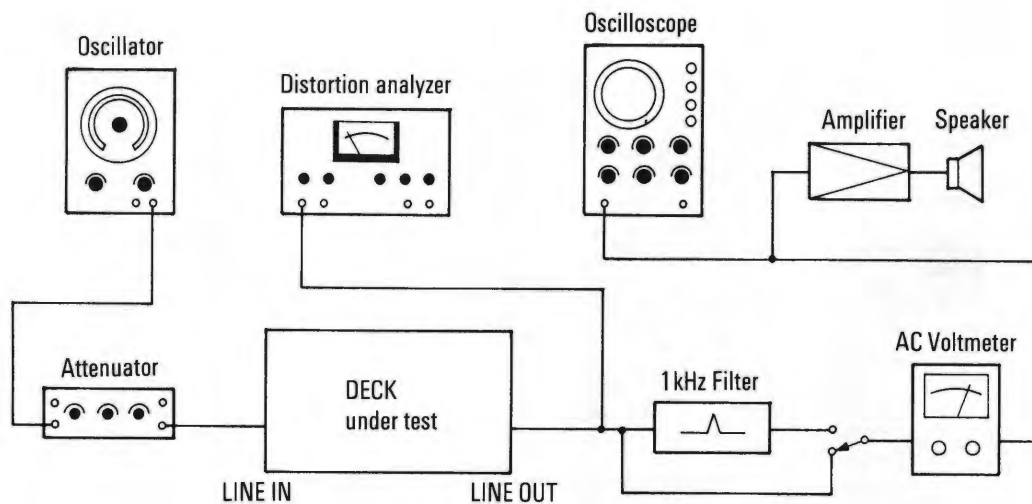


Fig. 6-1 Basic test setup

図6-1 基本測定接続図

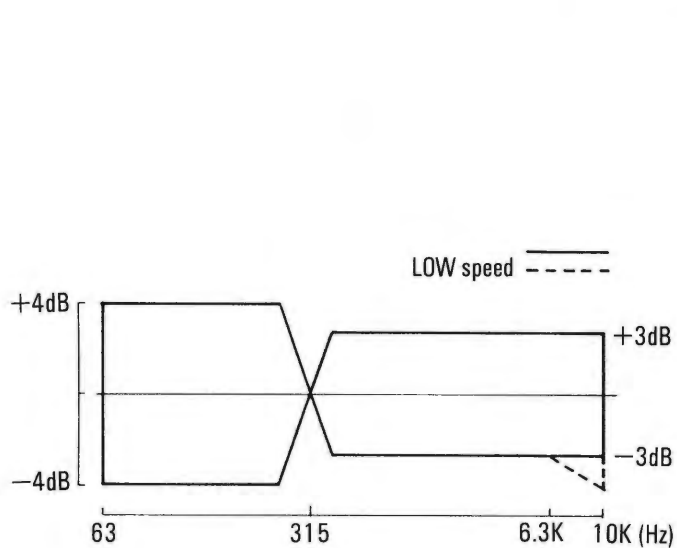


Fig. 6-2 Playback frequency response

図6-2 再生周波数特性

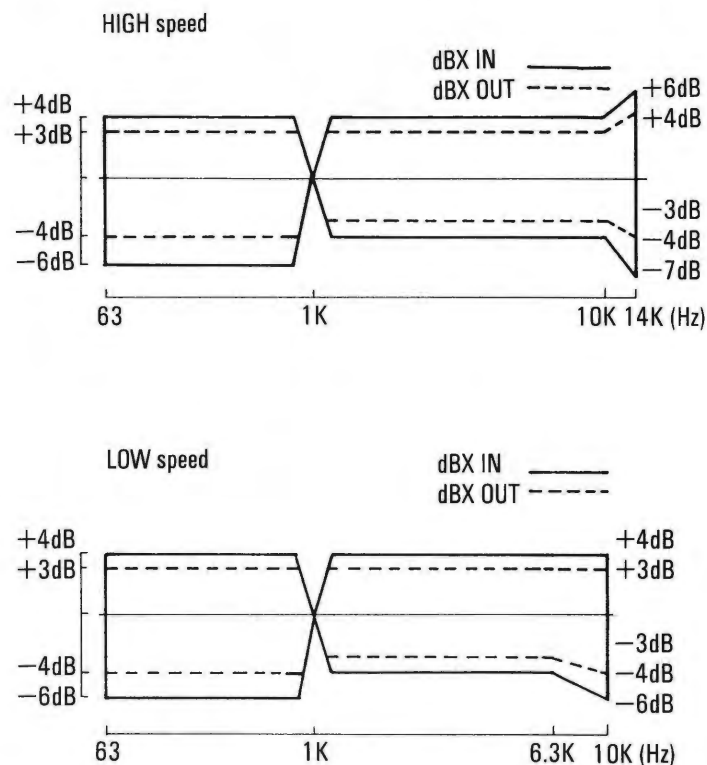
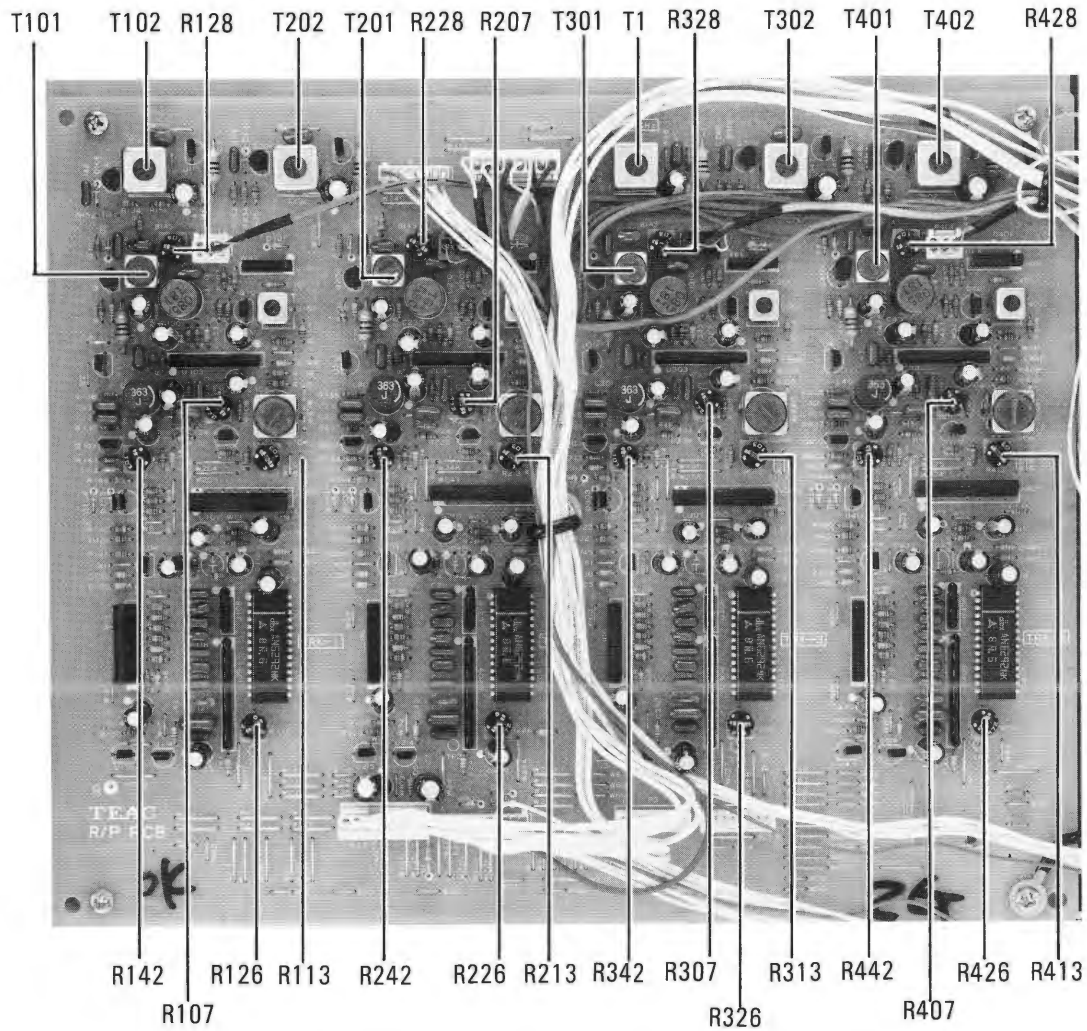


Fig. 6-3 Overall frequency response

図6-3 録再周波数特性



| REFERENCE NUMBER    | FUNCTION           |
|---------------------|--------------------|
| R113/R213/R313/R413 | REPRO LEVEL        |
| R107/R207/R307/R407 | REPRO EQ           |
| T1                  | BIAS OSC FREQUENCY |
| T101/T201/T301/T401 | REC BIAS TUNING    |
| T102/T202/T302/T402 | ERASE BIAS TUNING  |
| R126/R226/R326/R426 | DBX TIMING         |
| R128/R228/R328/R428 | REC BIAS           |
| R142/R242/R342/R442 | REC LEVEL          |

**Fig. 6-4** Adjustment and test point locations

図6-4 調整とテストポイント箇所



### 6-1. Caution

1. Before beginning adjustments of the amplifier section, be sure to thoroughly demagnetize the erase head, record/playback head and tape handling parts, and also clean them with a recorder cleaner.
2. Use a level meter with input impedance of 1 megohms or more.
3. It is indicated as  $0 \text{ dBV} = 1\text{V}$ .
4. Use the TEAC MTT-5561 blank tape or equivalent tape.
5. Unless otherwise specified, perform adjustments in order starting with the CH-1. The circuit numbers R126 ( R226 - R426) indicate the CH 1 (CH-2 - CH-4) respectively.

### 6-2. Reproduction Section

Mode: PLAY

| Adjustment                            | Preparation/Setting                           | Input Signal  | Adjust             | Measurement (Place/Value) Remarks  |
|---------------------------------------|---|---------------|--------------------|--|
| 1. Playback Reference Level           | Connection: Fig. 6-1<br>Tape Speed: high      | MXT-112       | R113 (R213 - R413) | Each CH: -10dBV  |
| 2. Playback Frequency Characteristics | Connection: Fig. 6-1<br>Tape speed: high      | MXT-116       | R107 (R207 - R407) | Each CH: Standard Fig. 6-2<br>Adjust so that 10kHz level becomes 0dB (same level as 315Hz)                                   |
|                                       | Connection: Fig. 6-1<br>Tape speed: low       | MTT-356       | Check              | Each CH: Standard, Fig. 6-2  |
| 3. Level Difference Between Channels  | Connection: Fig. 6-1                          | MXT-116       | Check              | Each CH: 63Hz - 10kHz:<br>less than 3dB  |
| 4. Level Fluctuation                  | Same as above                                 | Same as above | Same as above      | Each CH: 63Hz - 6.3kHz:<br>less than 2dB<br>6.3 - 10kHz: less than 3dB   |
| 5. Playback S/N Ratio                 | Connection: Fig. 6-1<br>Tape speed: high, low | -----         | Same as above      | Values when played back leader tape portion during reference output.<br>Each CH: High: more than 48dB<br>Low: more than 46dB |

## 6-3. Recording Section

Mode: REC/PLAY

| Adjustment                                      | Preparation/Setting  | Input Signal  | Adjust             | Measurement (Place/Value) Remarks   |
|---|--|---|--------------------|---|
| 1. Bias Oscillation Frequency                   | Connection: connect frequency counter to terminals of erase head.<br>REC function switch: all CH on  | -----   | T1                 | Adjust to obtain 85kHz frequency between terminals of erase head.   |
| 2. Record/play Head Bias Tuning                 | Connection: connect oscilloscope between terminals of record/play head (use probe after setting it to X10)<br>REC function switch: all CH on | -----   | T101 (T201 - T401) | Adjust so that output at record/play head terminals becomes maximum.  |
| 3. Erase Head Bias Tuning                       | Connection: connect oscilloscope between terminals of erase head (use probe after setting it to X10)   | -----   | T102 (T202 - T402) | Adjust so that output at erase head terminals becomes maximum.  |
| 4. dbx Timing                                   | Connection: connect DC voltmeter between pin No. 13 of U107 (U207 - U407) and -6.5V power supply.  | -----   | R126 (R226 - R426) | Adjust so that DC current between U107 (U207 - U407) and -6.5V power supply becomes 18.4mV.   |
| 5. Bias Setting                                 | Connection: Fig. 6-1<br>Tape speed: low<br>dbx NR: in  | -30dBV (-20dB against reference input)              | R128 (R228 - R428) | Adjust so that levels for 1kHz and 10kHz are the same.  |
| 6. Recording Reference Level                    | Connection: Fig. 6-1<br>Tape speed: high, low<br>dbx NR: in, out   | 1kHz/-10dBV (Reference input)                       | R142 (R242 - R442) | Adjust to produce reference output - 10dBV when recorded and played back.   |
| 7. Recording/Playback Distortion Rate           | Same as above  | Same as above                                       | Check              | Each CH: less than 1.6%   |
| 8. Recording/Playback Frequency Characteristics | Connection: Fig. 6-1<br>Tape speed: high, low<br>dbx NR: in, out   | 63Hz - 14kHz/-30dBV (-20dB against reference input) | Check              | Each CH: Standard Fig. 6-3  |
| 9. Level Difference Between Channels            | Connection: Fig. 6-1<br>dbx NR: out  | Same as above                                       | Same as above      | Level difference among 3 channels within recording/playback frequency characteristics specification. 63Hz - 10kHz: less than 3dB  |
| 10. Recording/Playback Level Fluctuation        | Same as above  | Same as above                                       | Same as above      | Level fluctuation between channels specified in specifications for recording/playback frequency characteristics:<br>1kHz: less than 1dB<br>63Hz - 6.3kHz: less than 2dB<br>6.3 - 14kHz: less than 3dB |
| 11. Cross-Talk Between Tracks                   | Connection: Fig. 6-1<br>Tape speed: low<br>REC function switch: all CH on  | tracks 1, 3: 125Hz/-10dBV<br>tracks 2, 4: no signal | Same as above      | Playback output ratio on tracks 1, 3 and tracks 2, 4: more than 35dB. Also measure cross-talk when 125Hz/-10dB signal is applied to tracks 2, 4 and no signal to tracks 1, 3.                         |
| 12. Channel separation                          | Connection: Fig. 6-1 (use 1kHz B.P.F.)<br>Tape speed: low<br>REC function switch: all CH on  | CH 1, 4: 1kHz/-10dBV<br>Other CH: no signal         | Same as above      | Ratio for playback output on channels 1, 4 and channels 2, 3: more than 45dB. Also measure between channel 2 and channels 1, 3 and between channel 3 and channels 2, 4.                               |
| 13. Erase Rate                                  | Connect: Fig. 6-1 (use 1kHz B.P.F.)<br>Tape speed: high  | 1kHz/0dBV (+10dB against reference level)           | Same as above      | Read playback level on recorded portion as reference level and erase the same portion then playback. Ratio between output levels: more than 65dB  |
| 14. Recording/Playback S/N Ratio                | Connection: Fig. 6-1<br>Tape speed: high, low<br>dbx NR: out   | No signal   | Same as above      | Ratio between reference output level and no-signal recording/playback output level:<br>High: more than 46dB<br>Low: more than 44dB<br>Difference between channels: less than 4dB                      |

## 6-1. 注意

1. アンプ部の調整の前に、消去ヘッド、録・再ヘッド、テープ走行部分をそれぞれ充分消磁し、クリーナ液で清掃して下さい。
2. レベル計は入力インピーダンス  $1\text{ M}\Omega$  以上のものを使用して下さい。
3.  $0\text{dBV}=1\text{V}$  で表示してあります。
4. ブランク・テープは、TEAC MTT-5561 又は、相当品を使用して下さい。
5. 特に指定の無い限り、調整は CH1から順番に行ってください。R126 (R226 ~R426) と記されている回路番号は、CH1 (CH2 ~CH4) を示します。

| 調整項目         | 準備・設定                              | 入力信号    | 調整箇所             | 測定箇所・調整値  | 備考 |
|--------------|------------------------------------|---------|------------------|---|----|
| 1. 再生基準レベル   | 接続: Fig 6-1<br>テープスピード: HIGH       | MXT-112 | R113 (R213~R413) | 各 ch: $-10\text{dBV}$   |    |
| 2. 再生周波数特性   | 接続: Fig 6-1<br>テープスピード: HIGH       | MXT-116 | R107 (R207~R407) | 各 ch: 規格 Fig 6-2<br>10kHzのレベルが $0\text{dB}$ (315Hzと同レベル) になるように調整 |    |
|              | 接続: Fig 6-1<br>テープ・スピード: LOW       | MTT-356 | チェック             | 各 ch: 規格 Fig 6-2  |    |
| 3. チャンネル間レベル | 接続: Fig 6-1                        | MXT-116 | チェック             | 各 ch: 63~10kHz: 3dB以内   |    |
| 4. レベル変動     | 同上                                 | 同上      | 同上               | 各 ch: 63~6.3kHz: 2dB以内<br>6.3k~10kHz: 3dB以内                       |    |
| 5. 再生 S/N    | 接続: Fig 6-1<br>テープ・スピード: HIGH, LOW | ———     | 同上               | 基準出力状態で、リーダー・テープ部を再生したときの値<br>各 ch: HIGH: 48dB以上<br>LOW: 46dB以上   |    |

| 調整項目                        | 準備・設定   | 入力信号                               | 調整箇所             | 測定箇所・調整値   | 備考 |
|-----------------------------|---|------------------------------------|------------------|--|----|
| 1. バイアス発振周波数                | 接続：消去ヘッド端子間に周波数カウンタを接続<br>REC FUNC SW：全ch ON                        | —————                              | T1               | 消去ヘッド端子で周波数が85kHzになるように調整  |    |
| 2. 録再ヘッド<br>バイアス・<br>チューニング | 接続：録再ヘッド端子間にオシロスコープを接続<br>(＊プローブはX10にして使用)<br>REC FUNC SW：全ch ON    | —————                              | T101 (T201～T401) | 録再ヘッド端子間の出力が最大になるように調整   |    |
| 3. 消去ヘッド<br>バイアス・<br>チューニング | 接続：消去ヘッド端子間にオシロスコープを接続<br>(＊プローブはX10にして使用)<br>REC FUNC SW：全ch ON    | —————                              | T102 (T202～T402) | 消去ヘッド端子の出力が最大になるように調整  |    |
| 4. dbx タイミング                | 接続：U107 (U207～U407)の13番端子と-6.5V電源間にDCボルトメータを接続                      | —————                              | R126 (R226～R426) | U107 (U207～U407)と-6.5V電源間の直流電流が18.4mVになるように調整  |    |
| 5. バイアス・セット                 | 接続：Fig 6-1<br>テープ・スピード：LOW<br>dbx NR：IN                             | -30dBV<br>(基準入力に対して-20dB)          | R128 (R228～R428) | 1kHzと10kHzが同レベルになるように調整  |    |
| 6. 録音基準レベル                  | 接続：Fig 6-1<br>テープ・スピード：<br>HIGH, LOW<br>dbx NR：IN, OUT              | 1kHz/-10dBV<br>(基準入力)              | R142 (R242～R442) | 録音・再生したとき、基準出力-10dBVがでるように調整   |    |
| 7. 録再歪率                     | 同上  | 同上                                 | チェック             | 各ch：1.6%以下   |    |
| 8. 録再周波数特性                  | 接続：Fig 6-1<br>テープ・スピード：<br>HIGH, LOW<br>dbx NR：IN, OUT              | 63～14kHz/-30dBV<br>(基準入力に対して-20dB) | チェック             | 各ch：規格Fig 6-3  |    |
| 9. チャンネル間<br>レベル差           | 接続：Fig 6-1<br>dbx NR：OUT  | 同上                                 | 同上               | 録再周波数特性規格内に於けるch間レベル差<br>63～10kHz：3dB以内  |    |
| 10. 録再レベル変動                 | 同上  | 同上                                 | 同上               | 録再周波数特性規格内に於けるch間レベル変動<br>1kHz：1dB以内<br>63～6.3kHz：2dB以内<br>6.3k～14kHz：3dB以内          |    |
| 11. トラック間<br>クロストーク         | 接続：Fig 6-1<br>テープ・スピード：LOW<br>REC FUNC SW：全ch ON                    | 1,3ch：125Hz/-10dBV<br>2,4ch：無信号    | 同上               | 1,3chの再生出力と2,4chの再生出力との比：<br>35dB以上<br>以下1,3ch：無信号 2,4ch：125Hz/-10dB<br>の場合も同様に測定する。 |    |
| 12. チャンネル・<br>セパレーション       | 接続：Fig 6-1<br>(1kHz B.P.F.使用)<br>テープ・スピード：LOW<br>REC FUNC SW：全ch ON | 1,4ch：1kHz/-10dBV<br>他ch：無信号       | 同上               | 1,4ch再生出力と2,3ch再生出力との比：<br>45dB以上<br>以下2ch→1,3ch 3ch→2,4ch<br>の場合も同様に測定する。           |    |
| 13. 消去率                     | 接続：Fig 6-1<br>(1kHz B.P.F.使用)<br>テープ・スピード：HIGH                      | 1kHz/0dBV<br>(基準レベルに対して+10dB)      | 同上               | 録音部分を再生したときのレベルを基準レベルとし、録音部分を消去し、それを再生したときの出力レベルとの比：65dB以上                           |    |
| 14. 録再S/N                   | 接続：Fig 6-1<br>テープ・スピード：<br>HIGH, LOW<br>dbx NR：OUT                  | 無信号                                | 同上               | 基準出力レベルと無信号録再出力レベルとの比：<br>HIGH：46dB以上<br>LOW：44dB以上<br>チャンネル差：4dB以内                  |    |

## 7. CONFIRMATION OF MIDI FUNCTION

### MIDI動作確認

You can confirm the MIDI function without using an external MIDI device (such as keyboard, sequencer, etc.). Connect 2 units of the 644 with MIDI cables and confirm the MIDI function.

The items to be confirmed are shown below.

**Note:** The section 7-2 includes the confirmation as to whether the tape recorder function is proper or not.

#### 7-1. Function (data transmitting and receiving) of MIDI IN/OUT Terminals

Use the factory presets as data (the SCENES 01 through 12 are preset at the factory).

1. Connect 2 units of the 644 with 2 MIDI cables as shown in the illustration and set the MIDI channels for transmission and reception to the same channel.

**Note:** If the MIDI channels are not set to the same channel, transmission and reception cannot be performed.

2. Maintain the data at the transmission side the same and change some portion of the data at reception side.
3. Switch the SYNC Selector switch on the transmission/reception unit to the SCENE DATA position and keep pressing the STORE/COPY button on the transmission side then press the LOAD/SAVE button. Confirm that the display on the reception side changes the SCENE numbers from 01 to 99 (approx. 2 seconds) and the number 99 will blink then the transmission and reception operations will be complete.
4. Place the SYNC Selector switch on the reception side to the OFF position and check the SCENE numbers from 01 to 99 on the assign display (data). If the contents of the data are same as those of transmission side (factory presets), it is normal. If the contents of data are not same, it means that the data was not received because the hardware of the unit has some problem. (There is no problem in the software.)

#### 7-2. FSK Conversion (internal) Function for Saving onto Tape

You can verify with one unit of the 644.

1. Record the factory preset data onto a tape.
2. Change some portion of the factory preset data.
3. Load the tape, when loading is completed verify that the SCENE numbers 01 through 99 on the assign display is same as those of the factory presets.  
If they are not same as the factory presets, the hardware (including the Record/Playback amplifier circuit) of the unit has a problem.

**Note:** You can check if the data is recorded onto the tape by monitoring the TRK-4.

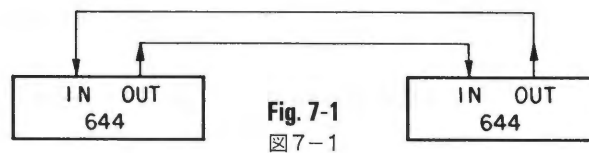
実際に外部MIDI機器（キーボード、シーケンサー等）を使用しなくても、2台の644をMIDIケーブルで接続することにより、MIDIの動作確認をすることができます。

確認項目は、次の通りです。尚、7-2項は、テープ・レコーダ機能の良否も含まれます。

#### 7-1. MIDI IN/OUT 端子からの動作 (データの送受信)

FACTORY PRESET (SCENE 01～12までセット済み) をデータとして使用します。

1. 2台の644を図のようにMIDIケーブル2本で接続し、送受信のMIDI CHを一致させる。  
注. MIDI CHが一致していない場合は、送受信できません。



2. 送信側のデータはFACTORY PRESETのまま、受信側のデータを一部変更する。
3. 送受信本体のSYNC SELECTOR をSCENE DATAのポジションに切換え、送信側のSTORE/COPYキーを押しながらLOAD/SAVEキーを押すと、受信側ディスプレイがSCENE 01～99まで(約2秒)変化し、99のNO. が点滅となり送受信終了となることを確認する。
4. 受信側本体のSYNC SELECTOR をOFFのポジションに切換え、受信側のSCENE 01～12・・・99までのアサインの表示(データ)を確認する。このとき、データの内容が送信側のデータ(FACTORY PRESET)と同じであれば正常です。もし、送信側のデータと同じでなかった場合は、データが受信されなかったということで本体のハードに何らかの問題があります。(ソフト上の問題は一切ありません。)

#### 7-2. TAPE SAVE 用 FSK変換 (内部) 動作

1台の644で確認を行います。

1. FACTORY PRESETデータをテープに記録する。
2. FACTORY PRESETデータを一部変更する。
3. テープをLOADし、終了後SCENE 01～12・・・99までのアサイン表示が、FACTORY PRESETになっていることを確認する。  
もし、FACTORY PRESETになっていない等の場合は本体のハード(R/P アンプ回路も含む)に問題があります。  
尚、テープに記録されたかどうかは、TRK-4をモニターすることで判断することができます。

## 8. MIDI DATA FORMAT

### MIDI データ・フォーマット

#### 8-1. Kinds of Messages

1. MIDI TAPE SYNC by F8, FA and FC (for transmission and reception), FB and F2 (for transmission only).
2. Channel Mute On/Off by NOTE ON/OFF.
3. SCENE Number settings by PROGRAM CHANGE.
4. Saving and loading of SCENE data by EXCLUSIVE.

#### 8-1. メッセージの種類

1. 送受信 F8, FA, FC, 送信時のみ FB, F2 による MIDI TAPE SYNC
2. NOTE ON/OFF による CHANNEL MUTE ON/OFF
3. PROGRAM CHANGE による SCENE NO. のセット
4. EXCLUSIVE による SCENE DATA のセーブ、ロード

#### 8-2. 送信条件

#### 8-2. Transmission Conditions

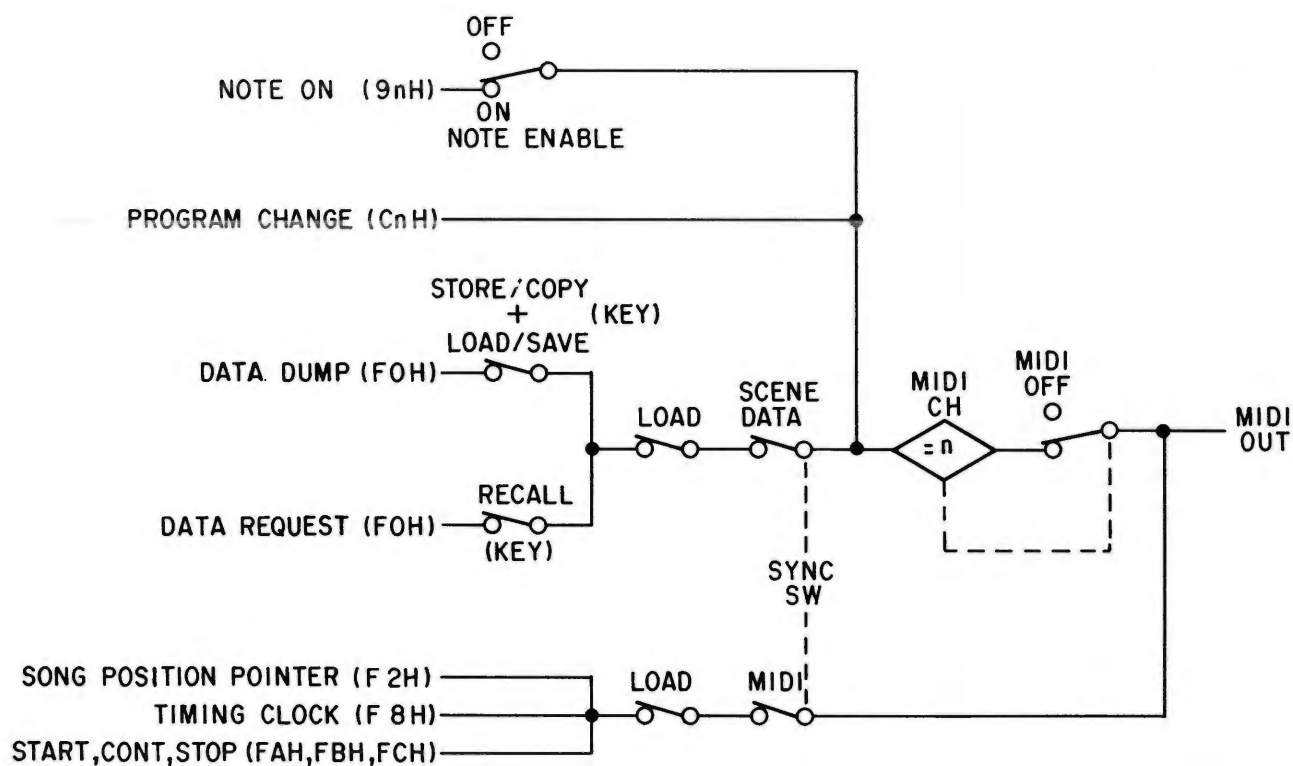


Fig. 8-1

図 8-1

#### \* NOTE ON/OFF

Outputs when the CH MUTE signal is accepted. But if the MIDI channel or the Note Enable is set to off, the signal will not be output.

#### \* PROGRAM CHANGE

Outputs when the RECALL button is pressed or the foot switch is used. But if the storing is in progress or the MIDI Channel is set in the off position, the signal will not be output.

#### ● NOTE ON/OFF

CH MUTE を受付けたとき出力されます。但し、MIDI CHANNELが“OFF”又は、NOTE ENABLE の設定が“OFF”のときは出力されません。

#### ● PROGRAM CHANGE

SCENE MODE で“RECALL”を押したとき又は、FOOT SWITCH 使用のとき出力されます。但し、STORE 状態又は、MIDI CHANNELが“OFF”のときは出力されません。

## 8-3. Transmission Data

## 8 - 3. 送信データ

## «Channel voice messages

(チャンネルボイスメッセージ)

## 1. NOTE ON/OFF

|               |          |   |
|---------------|----------|---|
| 1001nnnn(9nH) | STATUS   | n = CHANNEL NUMBER  |
| 0kkkkkkk      | NOTE NO. | k = 36 (C1) - 43(G1)  |
| 0vvvvvvv      | Velocity | MUTE ON : V = 96 (01100000)<br>MUTE OFF : V = 32 (00100000) |

## 2. PROGRAM CHANGE

|               |             |                  |
|---------------|-------------|------------------|
| 1100nnnn(CnH) | STATUS      | n=CHANNEL NUMBER |
| 0ppppppp      | PROGRAM NO. | p=0 - 98         |

«System real time message/System common messages ( システムリアルタイムメッセージ/システム共通メッセージ)

|               |                               |
|---------------|-------------------------------|
| 11111000(F8H) | TIMING CLOCK                  |
| 11111010(FAH) | START                         |
| 11111011(FBH) | CONTINUE                      |
| 11111100(FCH) | STOP                          |
| 11110010(F2H) | SONG POSITION POINTER         |
| 0llllllll     | llllllll: (LEAST SIGNIFICANT) |
| 0hhhhhhh      | hhhhhhh: (MOST SIGNIFICANT)   |





8-4. Receiving Condition

8 - 4 . 受信条件

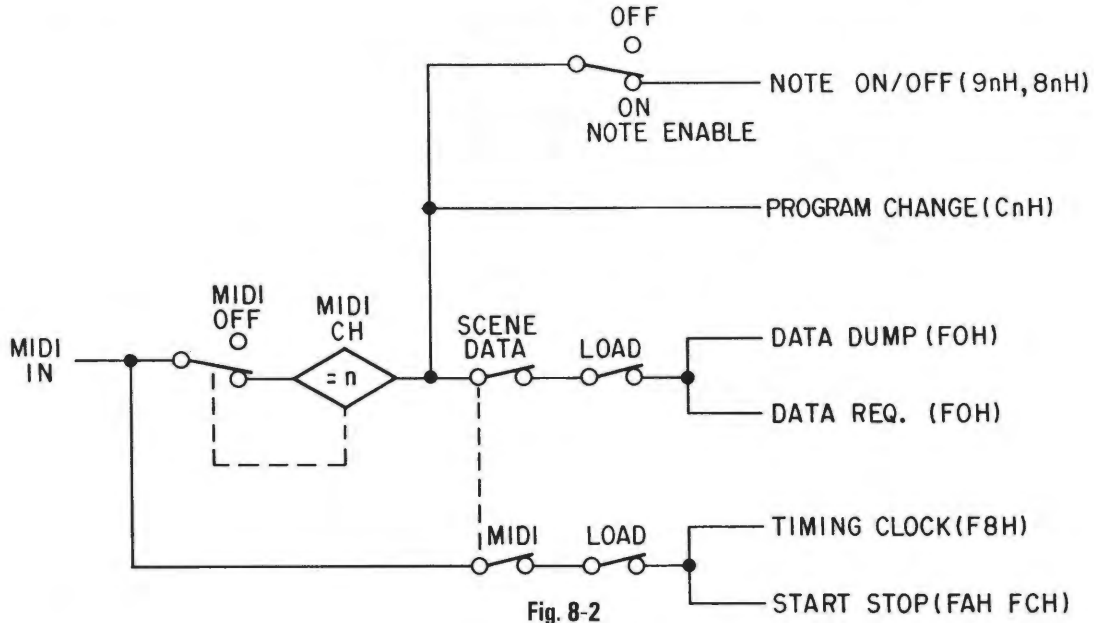


Fig. 8-2

\* NOTE ON/OFF

Can accept at all times except when the MIDI Channel is off, or the setting of the Note Enable is off, or the transmission channel and reception channel are different.

●NOTE ON/OFF

MIDI CHANNELが“OFF”，NOTE ENABLE の設定が“OFF”又は，送受信CHが一致しないとき以外は受け付け可能です。

\* PROGRAM CHANGE

Can accept at all times except when storing is being performed, or the MIDI Channel is off, or the transmission channel and reception channel are different.

●PROGRAM CHANGE

STORE 状態，MIDI CHANNELが“OFF”又は，送受信CHが一致しないとき以外は受け付け可能です。

8-5. Reception Data

8-5. 受信データ

« channel voice messages

(チャンネルボイスメッセージ)

1. NOTE ON/OFF

|               |          |
|---------------|----------|
| 1001nnnn(9nH) | STATUS   |
| 0kkkkkkk      | NOTE No. |
| 0vvvvvvv      | Velocity |

n=CHANNEL NUMBER  
 k=36(C1) - 43(G1)  
 MUTE ON : v=64 - 127  
 MUTE OFF : v=1 - 63

2. PROGRAM CHANGE

|               |             |
|---------------|-------------|
| 1100nnnn(CnH) | STATUS      |
| 0ppppppp      | PROGRAM NO. |

n=CHANNEL NUMBER  
 p=0 - 98

«System real time message/System common messages

|               |              |
|---------------|--------------|
| 11111000(F8H) | TIMING CLOCK |
| 11111010(FAH) | START        |
| 11111100(FCH) | STOP         |

(システムリアルタイムメッセージ/システム共通メッセージ)

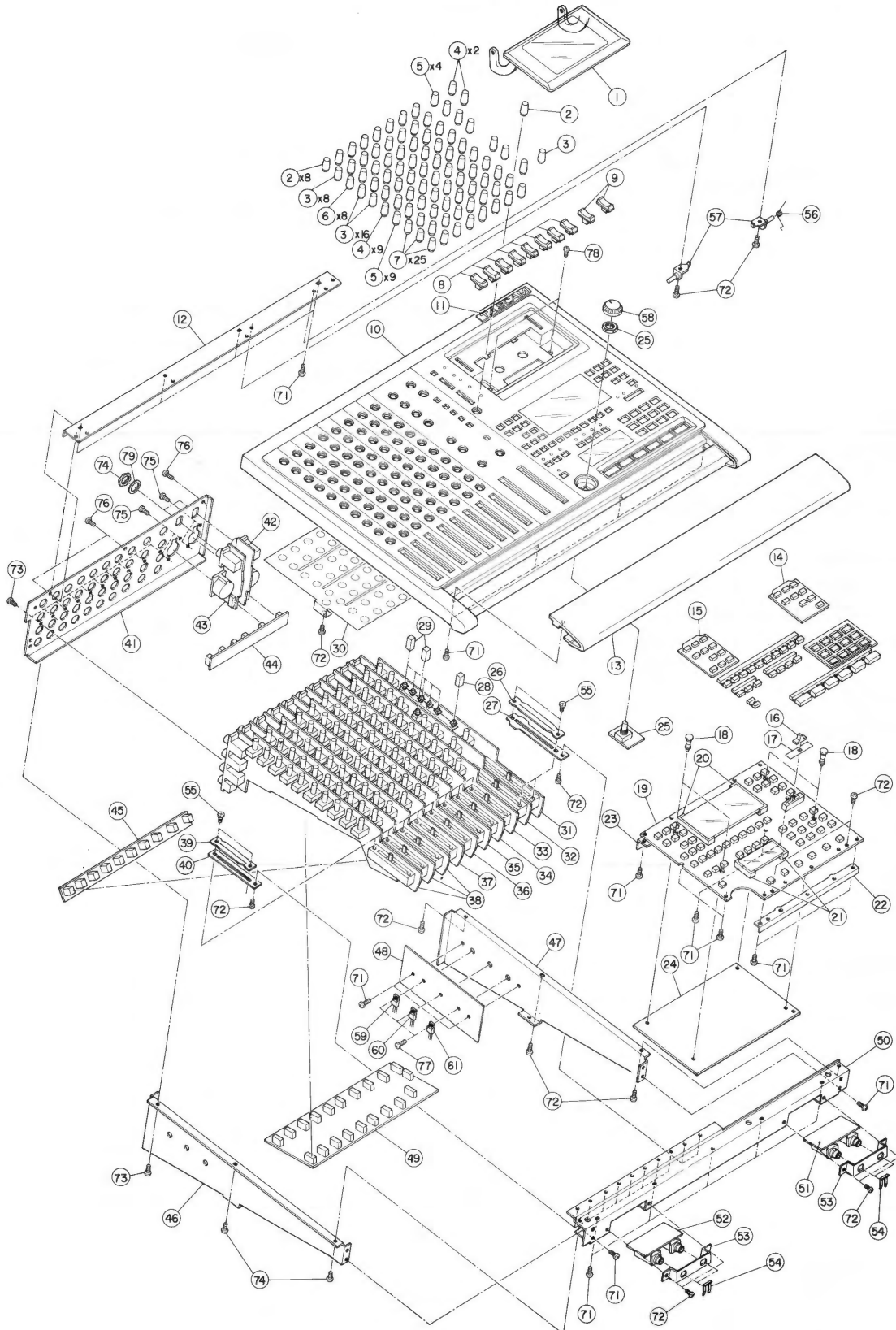
«System exclusive message

Same as transmission data.

# 9. EXPLODED VIEWS AND PARTS LIST

分解図と部品表

EXPLODED VIEW - 1

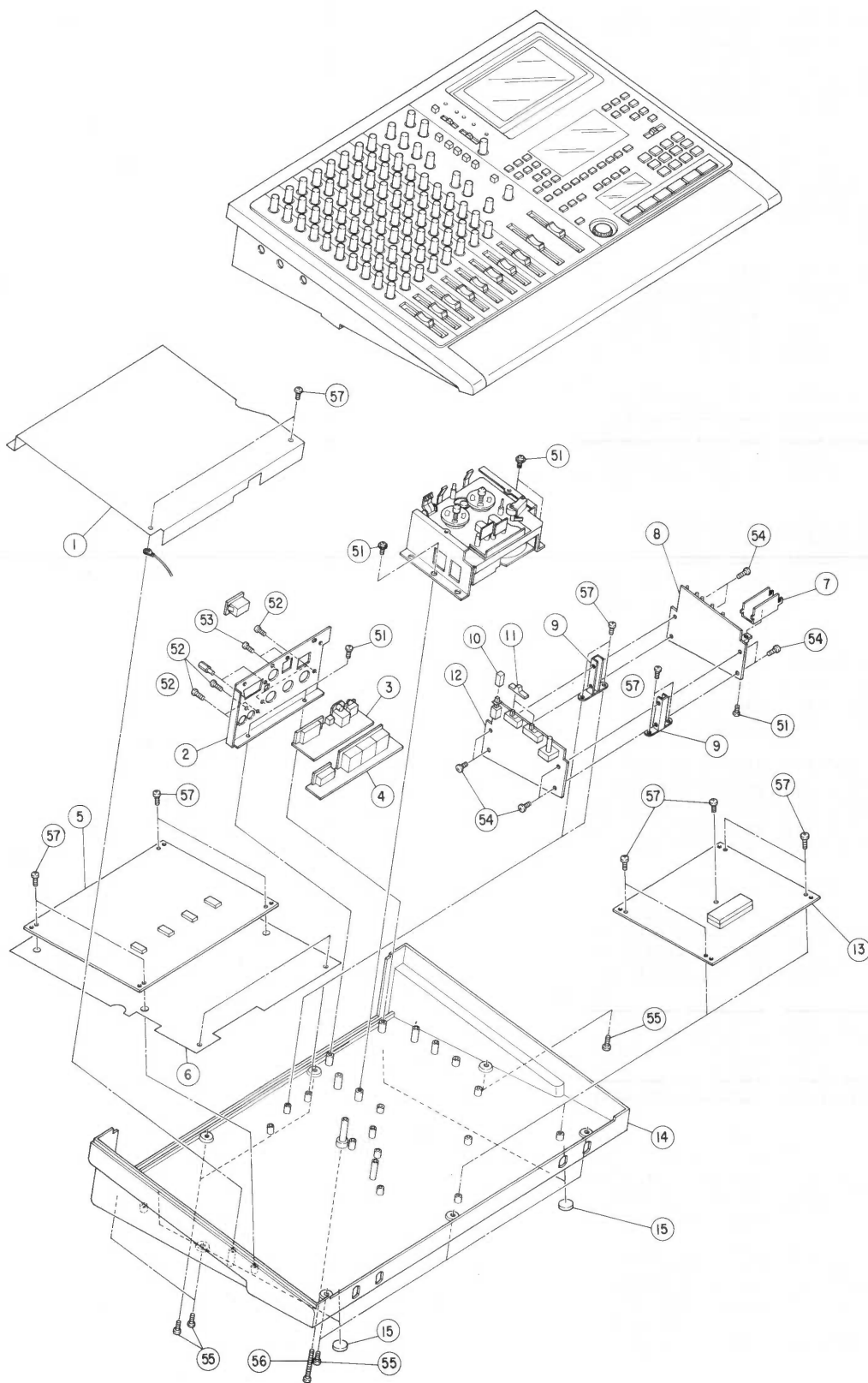


## EXPLODED VIEW-I

| REF.NO. | PARTS NO.   | DESCRIPTION            | REMARKS |
|---------|-------------|------------------------|---------|
| I- 1    | 5801259500  | COVER, CASSETTE        |         |
| I- 2    | 5801262300  | KNOB, RD               |         |
| I- 3    | 5801262200  | KNOB, OG               |         |
| I- 4    | 5801262000  | KNOB, GN               |         |
| I- 5    | 5801261900  | KNOB, BU               |         |
| I- 6    | 5801262400  | KNOB, YW               |         |
| I- 7    | 5801262100  | KNOB, GY               |         |
| I- 8    | 5801262500  | KNOB, FADER OG         |         |
| I- 9    | 5801262600  | KNOB, FADER RD         |         |
| I-10    | *5801258400 | CASE ASSY              |         |
|         | *5801258500 | CASE                   |         |
|         | *5801258600 | ADAPTOR, CASE          |         |
|         | *5801258700 | WINDOW, DISPLAY        |         |
|         | *5801258800 | WINDOW, COUNTER        |         |
|         | *5801258900 | BUTTON, OPERATION      |         |
|         | *5801259000 | BUTTON, COUNTER        |         |
|         | *5801259100 | BUTTON, CHANNEL        |         |
|         | *5801259200 | BUTTON(A), CONTROL     |         |
|         | *5801259300 | BUTTON(B), CONTROL     |         |
|         | *5800602901 | PLATE, TAPE INDICATION |         |
| I-11    | *5801291800 | BADGE, TASCAM          |         |
| I-12    | *5801259400 | PLATE, REAR            |         |
| I-13    | *5801260001 | PAD, CASE              |         |
| I-14    | 5801263100  | BUTTON(B), DISPLAY     |         |
| I-15    | 5801263000  | BUTTON(A), DISPLAY     |         |
| I-16    | 5801263300  | KNOB, SLIDE            |         |
| I-17    | *5801261400 | MASK, SW               |         |
| I-18    | *5787033000 | SUPPORT, PCB KGLS-10R  |         |
| I-19    | *5200276401 | SW PCB ASSY            |         |
| I-20    | *5801261600 | SPACER(L), LCD         |         |
| I-21    | *5801261700 | SPACER(S), LCD         |         |
| I-22    | *5801301900 | BRACKET, SW PCB        |         |
| I-23    | *5801301600 | BRACKET(B), SW PCB     |         |
| I-24    | *5200276501 | ASN CONT PCB ASSY      |         |
| I-25    | *5200293600 | SHTL PCB ASSY          |         |
| I-26    | *5801276900 | COVER(L), FADER        |         |
| I-27    | *5801261000 | BRACKET(L), VR         |         |
| I-28    | 5801276500  | BUTTON, ASSIGN OG      |         |
| I-29    | 5801262800  | BUTTON, ASSIGN GY      |         |
| I-30    | *5801276600 | PLATE, SHIELD FF       |         |
| I-31    | *5200277500 | MONITOR PCB ASSY       |         |
| I-32    | *5200277400 | EFFRTN PCB ASSY        |         |
| I-33    | *5200277251 | INPUT-8 PCB ASSY       |         |
| I-34    | *5200277241 | INPUT-7 PCB ASSY       |         |
| I-35    | *5200277231 | INPUT-6 PCB ASSY       |         |
| I-36    | *5200277221 | INPUT-5 PCB ASSY       |         |
| I-37    | *5200277211 | INPUT-4 PCB ASSY       |         |
| I-38    | *5200277201 | INPUT-1 PCB ASSY       |         |
| I-39    | *5801276800 | COVER(S), FADER        |         |
| I-40    | *5801261100 | BRACKET(S), VR         |         |
| I-41    | *5801260400 | PANEL(A), REAR         |         |
| I-42    | *5200278300 | JACK-L PCB ASSY        |         |
| I-43    | *5200278400 | JACK-R PCB ASSY        |         |
| I-44    | *5200277700 | BUSS-C PCB ASSY        |         |
| I-45    | *5200277601 | BUSS-A PCB ASSY        |         |

Parts marked with \*require longer delivery time.

EXPLODED VIEW — 2



## EXPLODED VIEW-2

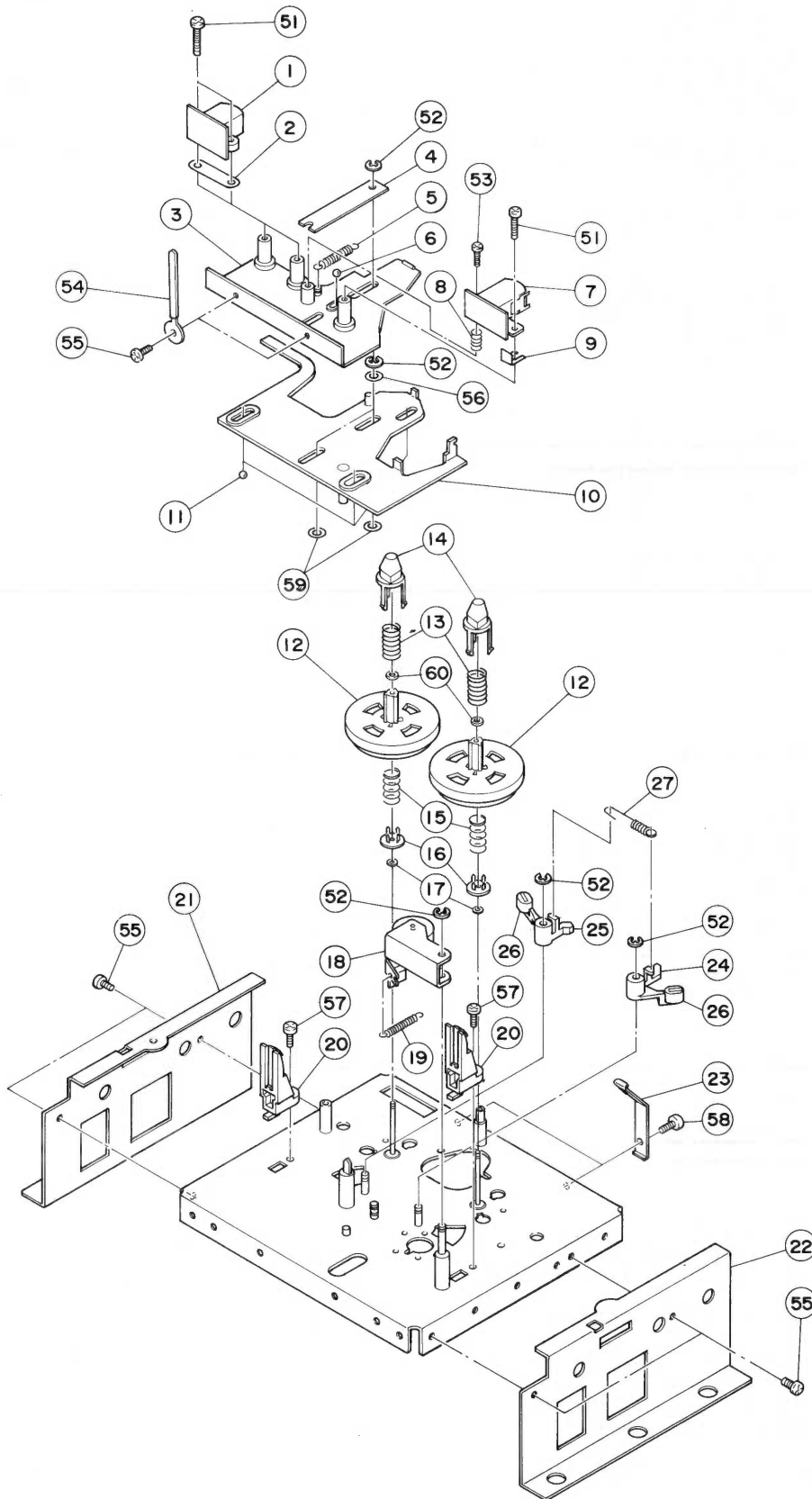
| REF.NO. | PARTS NO.   | DESCRIPTION                     | REMARKS |
|---------|-------------|---------------------------------|---------|
| 2- 1    | *5801261300 | PLATE(A), SHIELD                |         |
| 2- 2    | *5801260500 | PANEL(B), REAR                  |         |
| 2- 3    | *5200276801 | REMOTE PCB ASSY                 |         |
| 2- 4    | *5200276901 | SYNC PCB ASSY                   |         |
| 2- 5    | *5200276100 | R/P PCB ASSY                    |         |
| 2- 6    | *5801261200 | PLATE(F), SHIELD                |         |
| 2- 7    | *5800990100 | HEAT SINK                       |         |
| 2- 8    | *5200278101 | LED PCB ASSY                    |         |
| 2- 9    | *5801260800 | SUPPORT(A), PCB                 |         |
| 2-10    | 5801262700  | BUTTON, ASSIGN GN               |         |
| 2-11    | 5801263300  | KNOB, SLIDE                     |         |
| 2-12    | *5200278000 | PITCH CONT PCB ASSY             |         |
| 2-13    | *5200276200 | MECHA CONT PCB ASSY             |         |
| 2-14    | *5801261500 | CASE, BOTTOM                    |         |
| 2-15    | *5800620400 | FOOT, FELT                      |         |
| 2-51    | *5801276700 | SCREW, STEP M3X10               |         |
| 2-52    | *5783543008 | SCREW, BIND P-TITE M3X8 (BLKN1) |         |
| 2-53    | *5780023006 | SCREW, BIND M3X6 (BLKN1)        |         |
| 2-54    | *5780003005 | SCREW, BIND M3X5                |         |
| 2-55    | *5780003008 | SCREW, BIND M3X8                |         |
| 2-56    | *5780003045 | SCREW, BIND M3X45               |         |
| 2-57    | *5783603008 | SCREW, BIND P-TITE M3X8         |         |

## EXPLODED VIEW-1

| REF.NO. | PARTS NO.    | DESCRIPTION                     | REMARKS |
|---------|--------------|---------------------------------|---------|
| 1-46    | *5801260100  | CHASSIS(L), SIDE                |         |
| 1-47    | *5801260200  | CHASSIS(R), SIDE                |         |
| 1-48    | *5801260700  | HEATSINK                        |         |
| 1-49    | *5200278201  | BUS-B PCB ASSY                  |         |
| 1-50    | *5801260300  | CHASSIS, FRONT                  |         |
| 1-51    | *5200276701  | JACK-B PCB ASSY                 |         |
| 1-52    | *5200276600  | JACK-A PCB ASSY                 |         |
| 1-53    | *5801260600  | PLATE, JACK                     |         |
| 1-54    | *5317005800  | PLATE(S), MOUNT                 |         |
| 1-55    | *5800501800  | SCREW, STEP H                   |         |
| 1-56    | 5801259901   | SPRING, UP                      |         |
| 1-57    | *5801259600  | HOOK ASSY, CASSETTE COVER       |         |
| 1-58    | 5801263200   | KNOB, SHUTTLE                   |         |
| 1-59    | △ 5230509700 | TR., 2SB1274R                   |         |
| 1-60    | △ 5231762800 | TR., 2SD1913R                   |         |
| 1-61    | △ 5220435700 | IC., M5F7912L                   |         |
| 1-71    | *5783603008  | SCREW, BIND P-TITE M3X8         |         |
| 1-72    | *5780103005  | SCREW, PAN M3X5                 |         |
| 1-73    | *5783543008  | SCREW, BIND P-TITE M3X8 (BLKN1) |         |
| 1-74    | *5781851200  | NUT, M12                        |         |
| 1-75    | *5780122605  | SCREW, PAN M2.6X5 (BLKN1)       |         |
| 1-76    | *5780023006  | SCREW, BIND M3X6 (BLKN1)        |         |
| 1-77    | *5780003008  | SCREW, BIND M3X8                |         |
| 1-78    | *5780022608  | SCREW, BIND B-TITE M2.6X8       |         |
| 1-79    | *5785290300  | WAHSE, FIBER 12X17XIT           |         |

Parts marked with \*require longer delivery time.

EXPLODED VIEW — 3



## EXPLODED VIEW-3

| REF.NO. | PARTS NO.   | DESCRIPTION                | REMARKS |
|---------|-------------|----------------------------|---------|
| 3- 1    | *5378600900 | HEAD,ERASE                 |         |
| 3- 2    | 5800556200  | SPACER,HEAD                |         |
| 3- 3    | *5801197300 | BASE(P) ASSY,HEAD          |         |
| 3- 4    | 5800595500  | SPRING,PRESSURE            |         |
| 3- 5    | 5800615400  | SPRING,HEADA BASE          |         |
| 3- 6    | 5540055000  | STEEL BALL,M2              |         |
| 3- 7    | 5378601200  | HEAD,R/P                   |         |
| 3- 8    | 5800931300  | SPRING,HEAD                |         |
| 3- 9    | 5800595000  | SPACER,A 0.1MM             |         |
| 3-10    | *5801090300 | SLIDER ASSY                |         |
| 3-11    | 5540056000  | STEEL BALL,M3              |         |
| 3-12    | 5800735801  | TABLE ASSY,REEL            |         |
| 3-13    | 5800231300  | SPRING,REEL                |         |
| 3-14    | 5800236501  | RING,DRIVE                 |         |
| 3-15    | 5800481901  | SPRING,B. TENSION          |         |
| 3-16    | 5800231500  | HOLDER,SPRING              |         |
| 3-17    | *5800539800 | WASHER,1.7X4X0.3T          |         |
| 3-18    | 5801091400  | PINCH ARM ASSY             |         |
| 3-19    | 5800955800  | SPRING(R),P.ROLLER         |         |
| 3-20    | *5801197100 | GUIDE(U),CASSETTE          |         |
| 3-21    | *5801198300 | BRACKET(LI),MECHA.         |         |
| 3-22    | *5801198400 | BRACKET(RI),MECHA.         |         |
| 3-23    | 5801197200  | SPRING(U),HALF PRESSURE    |         |
| 3-24    | *5800439701 | ARM(R),BRAKE               |         |
| 3-25    | *5800439601 | ARM(L),BRAKE               |         |
| 3-26    | *5800126401 | SHOE,BRAKE                 |         |
| 3-27    | 5801199200  | SPRING(P),BRAKE            |         |
| 3-51    | *5780012006 | SCREW,BIND M2X6(N1)        |         |
| 3-52    | *5786002000 | E-RING,E-2                 |         |
| 3-53    | *5730029400 | SCREW,PWA2*8FNI            |         |
| 3-54    | *5786713400 | HARNES CLIP 3.2X6.0X47     |         |
| 3-55    | *5783002605 | SCREW,PAN S-TITE M2.6X5    |         |
| 3-56    | *5785303100 | WASHER,POLIS. 3X6X0.25T    |         |
| 3-57    | *5783032606 | SCREW,BIND S-TITE M2.6X6   |         |
| 3-58    | *5783002605 | SCREW,PAN S-TITE M2.6X5    |         |
| 3-59    | *5785313000 | WASHER,POLIS. 3X6X0.5T     |         |
| 3-60    | *5785331100 | WASHER,POLLS. 1.2X3.6X0.5T |         |

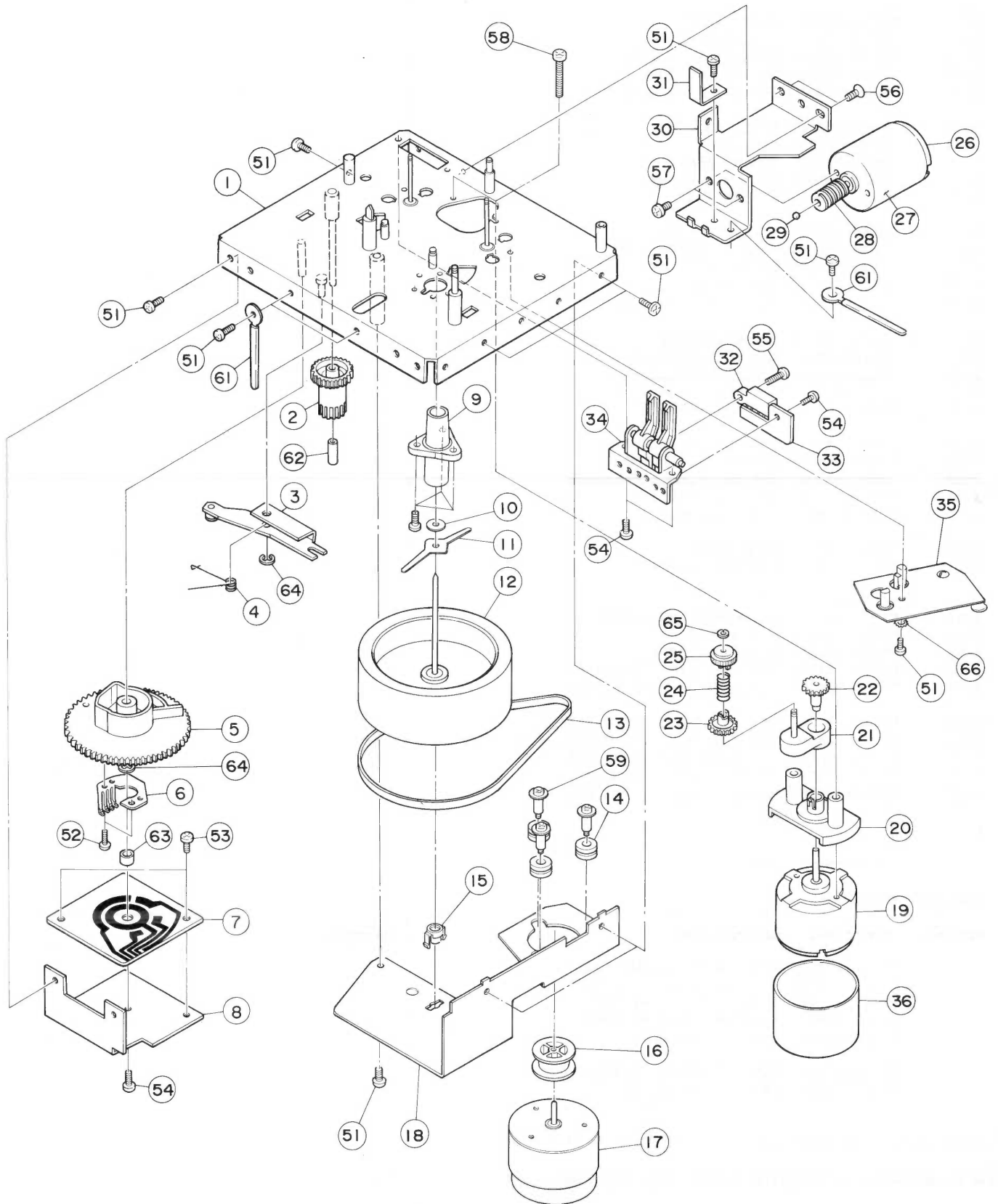
## INCLUDED ACCESORIES

| REF.NO. | PARTS NO.     | DESCRIPTION               | REMARKS |
|---------|---------------|---------------------------|---------|
|         | △ *5347012300 | ADAPTOR,AC PS-MI [J]      |         |
|         | △ *5347012400 | ADAPTOR,AC PS-MI [US,C]   |         |
|         | △ *5347012500 | ADAPTOR,AC PS-MI [E]      |         |
|         | △ *5347012600 | ADAPTOR,AC PS-MI [UK]     |         |
|         | *5700112300   | OWNER'S MANUAL [J]        |         |
|         | *5700112401   | OWNER'S MANUAL [EXCEPT J] |         |
|         | *5700112500   | OWNER'S MANUAL [C]        |         |

[US]:U.S.A. [E]:EUROPE [UK]:U.K. [C]:CANADA [J]:JAPAN

Parts marked with \*require longer delivery time.

EXPLODED VIEW - 4





## EXPLODED VIEW-4

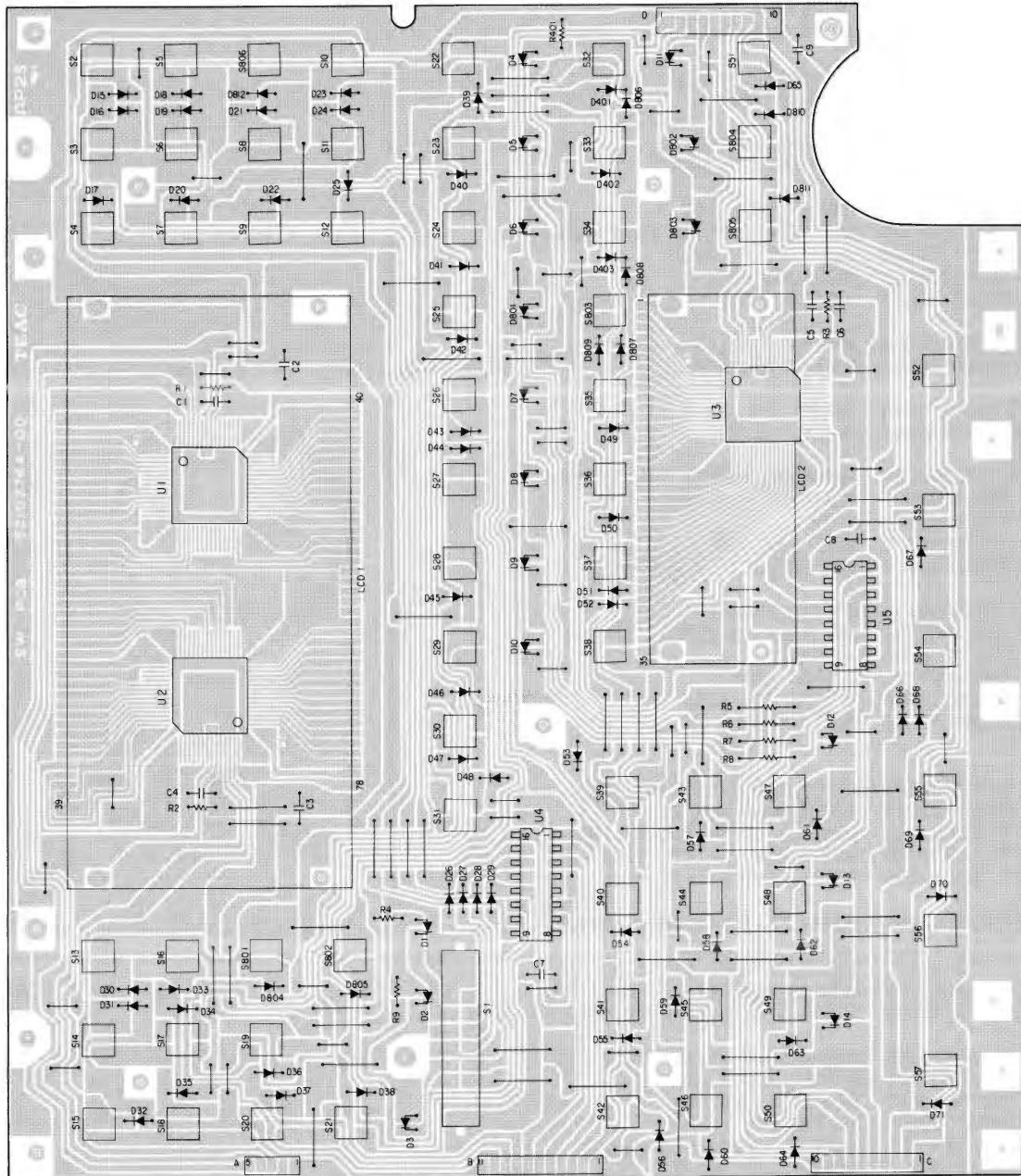
| REF.NO. | PARTS NO.    | DESCRIPTION                  | REMARKS |
|---------|--------------|------------------------------|---------|
| 4- 1    | *5801196700  | CHASSIS(P) ASSY,MECHA.       |         |
| 4- 2    | 5801093000   | GEAR,RELAY                   |         |
| 4- 3    | *5801092500  | ARM ASSY,BASE                |         |
| 4- 4    | 5801092400   | SPRING,BASE ARM              |         |
| 4- 5    | 5800737800   | CAM.,CONTROL                 |         |
| 4- 6    | *5800595300  | PLATE,CONTACT                |         |
| 4- 7    | *5210251800  | CAM PCB                      |         |
| 4- 8    | *5801092900  | BRACKET,CAM PCB              |         |
| 4- 9    | *5800106200  | HOUSING ASY,CAPSTAN          |         |
| 4-10    | *5800729400  | WASHER(A),TEFLON             |         |
| 4-11    | 5801197900   | SPRING(U),THRUST             |         |
| 4-12    | *5800238601  | CAPSTAN ASSY                 |         |
| 4-13    | 5800735500   | BELT                         |         |
| 4-14    | *5534537001  | CUSHION,RUBBER               |         |
| 4-15    | *5801198100  | PRESSURE(F),THRUST           |         |
| 4-16    | *5801198200  | PURREY,CAP. M12.7            |         |
| 4-17    | 5370008700   | MOTOR,DC CAPSTAN EG-530KD-2B |         |
| 4-18    | *5801198000  | PLATE(P),FW HOLD             |         |
| 4-19    | 5370002502   | MOTOR,DC REEL                |         |
| 4-20    | *5800732603  | HOLDER,MOTOR                 |         |
| 4-21    | 5800461500   | ARM ASY,PULLEY               |         |
| 4-22    | 5800736000   | PULLEY(A),GEAR               |         |
| 4-23    | 5800461600   | PULLEY(B) ASSY,GEAR          |         |
| 4-24    | △ 5800430200 | SPRING,PULLEY                |         |
| 4-25    | △ 5800430302 | PULLEY ASSY                  |         |
| 4-26    | △ 5370008200 | MOTOR,DC ASSIST MXN-13FB09B  |         |
| 4-27    | *5801204700  | PLATE(A),M SHIELD            |         |
| 4-28    | *5801093300  | WORM                         |         |
| 4-29    | 5540056000   | STEEL BALL,M3                |         |
| 4-30    | *5801093100  | BRACKET,ASSIST MOTOR         |         |
| 4-31    | 5801093200   | SPRING,THRUST                |         |
| 4-32    | *5302107300  | SW.,TAPE SELECTOR. SPPW62    |         |
| 4-33    | *5210275100  | SW PCB                       |         |
| 4-34    | *5801091600  | SW ARM ASSY                  |         |
| 4-35    | *5200275000  | SENSOR PCB ASSY              |         |
| 4-36    | *5800235900  | PLATE,SHIELD                 |         |
| 4-51    | *5783002605  | SCREW,PAN S-TITE M2.6X5      |         |
| 4-52    | *5781112004  | SCREW,BIND TAP 2X4           |         |
| 4-53    | *5783032605  | SCREW,BIND S-TITE M2.6X5     |         |
| 4-54    | *5783032003  | SCREW,BIND S-TITE M2X3       |         |
| 4-55    | *5783032006  | SCREW,BIND S-TITE M2X6       |         |
| 4-56    | *5783042605  | SCREW,FLAT S-TITE M2.6X5     |         |
| 4-57    | *5780003003  | SCREW,BIND M3X3              |         |
| 4-58    | *5780002617  | SCREW,BIND M2.6X17           |         |
| 4-59    | *5730033100  | SCREW,SHOULDER M2.6X5-2      |         |
| 4-60    | *5783032606  | SCREW,BIND S-TITE M2.6X6     |         |
| 4-61    | *5786713400  | HARNESCLIP,3.2X6.0X47        |         |
| 4-62    | *5785602085  | SPACER,2.0X8.5MM             |         |
| 4-63    | *5785604035  | SPACER,4.0X3.5MM             |         |
| 4-64    | *5786002000  | E-RING,E-2                   |         |
| 4-65    | *5785331500  | WASHER,POLIS. 1.5X4X0.5T     |         |
| 4-66    | *5785122600  | WASHER,LOCK M2.6             |         |

Parts marked with \*require longer delivery time.

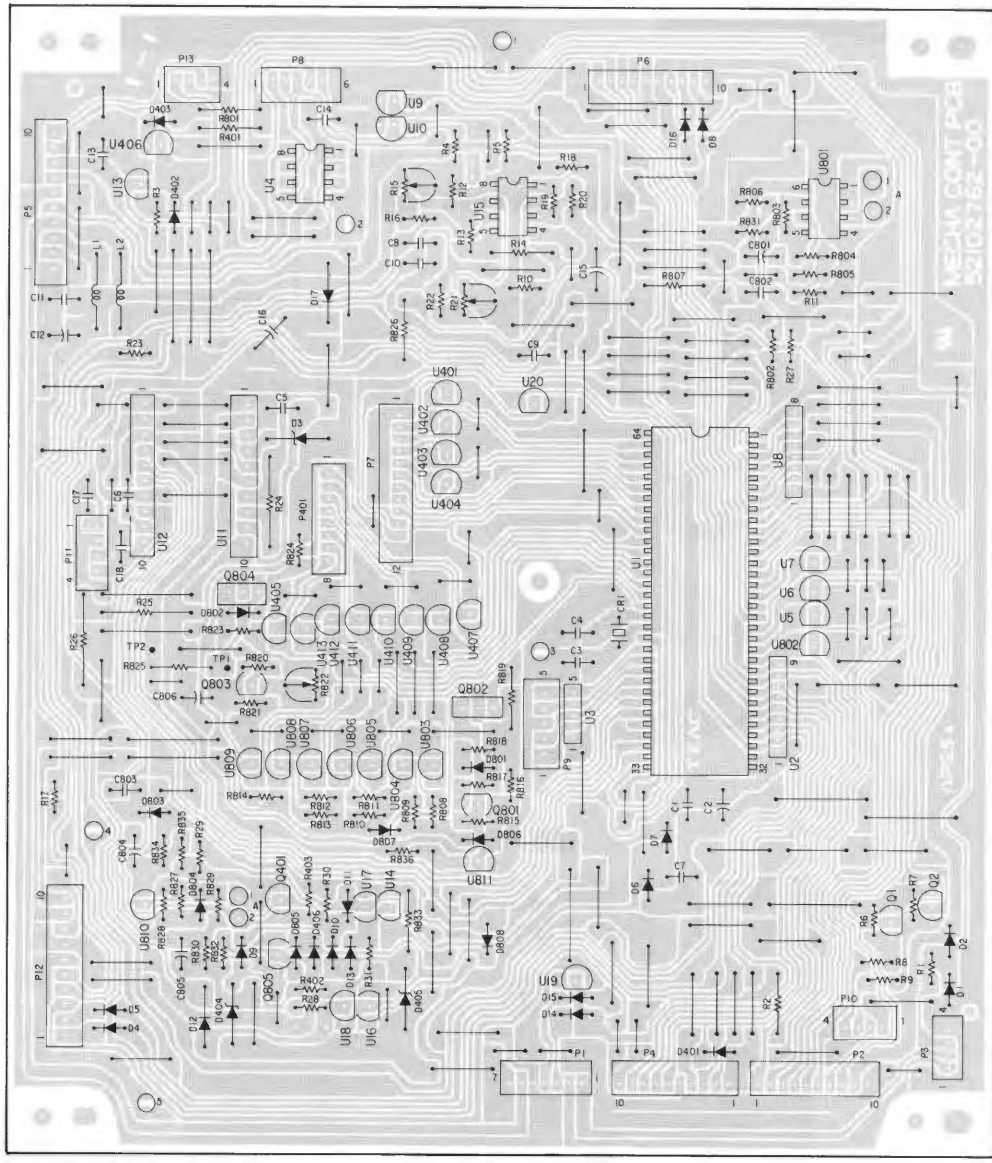
# 10. PC BOARDS AND PARTS LIST

基板と部品表

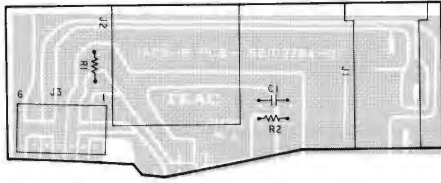
## SW PCB ASSY



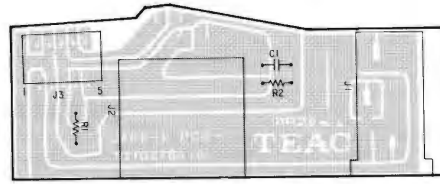
MECHA CONT PCB ASSY



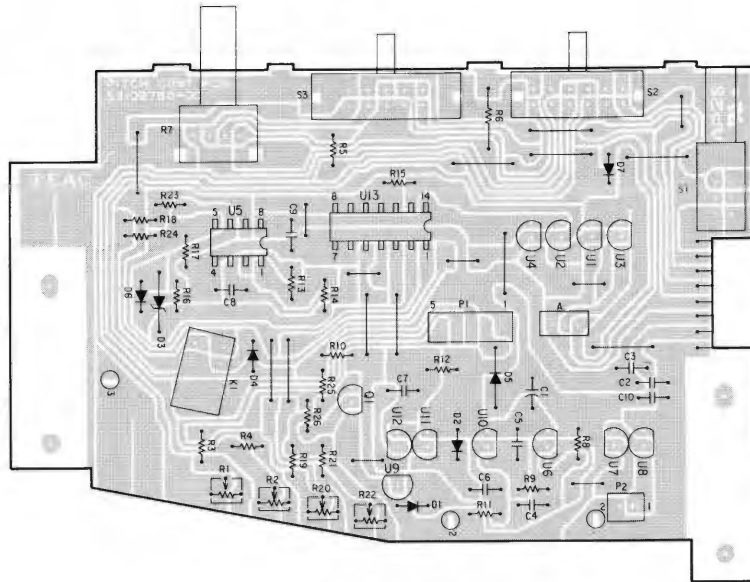
**JACK — R PCB ASSY**



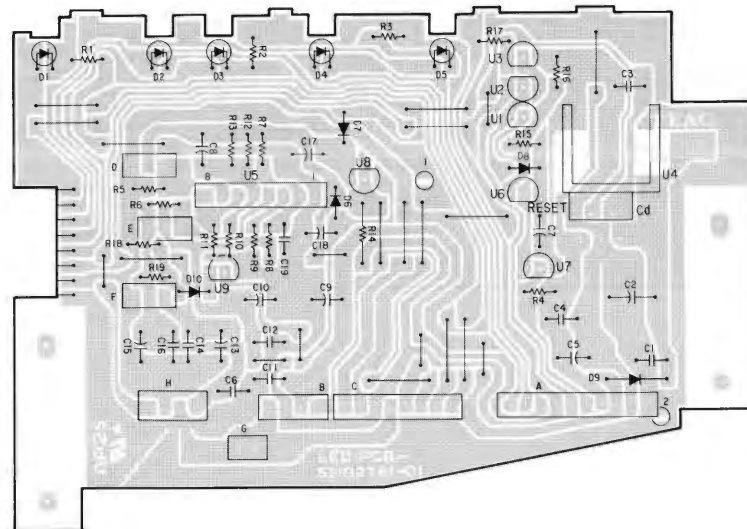
**JACK — L PCB ASSY**



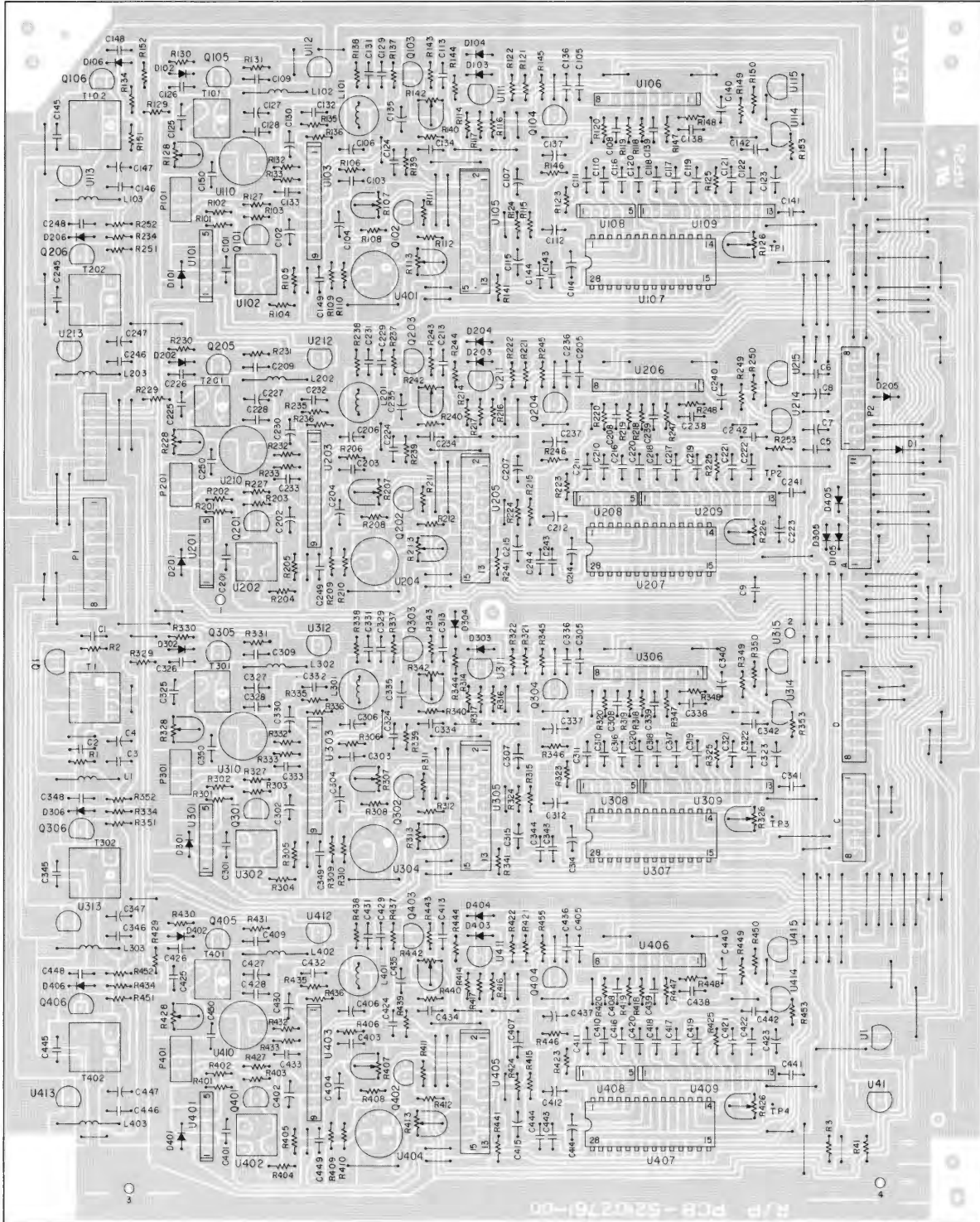
**PITCH CONT PCB ASSY**



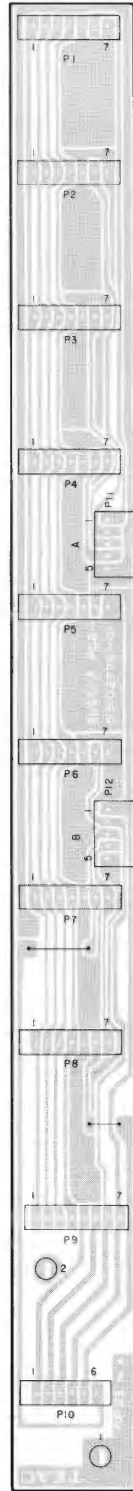
**LED PCB ASSY**



R/P PCB ASSY

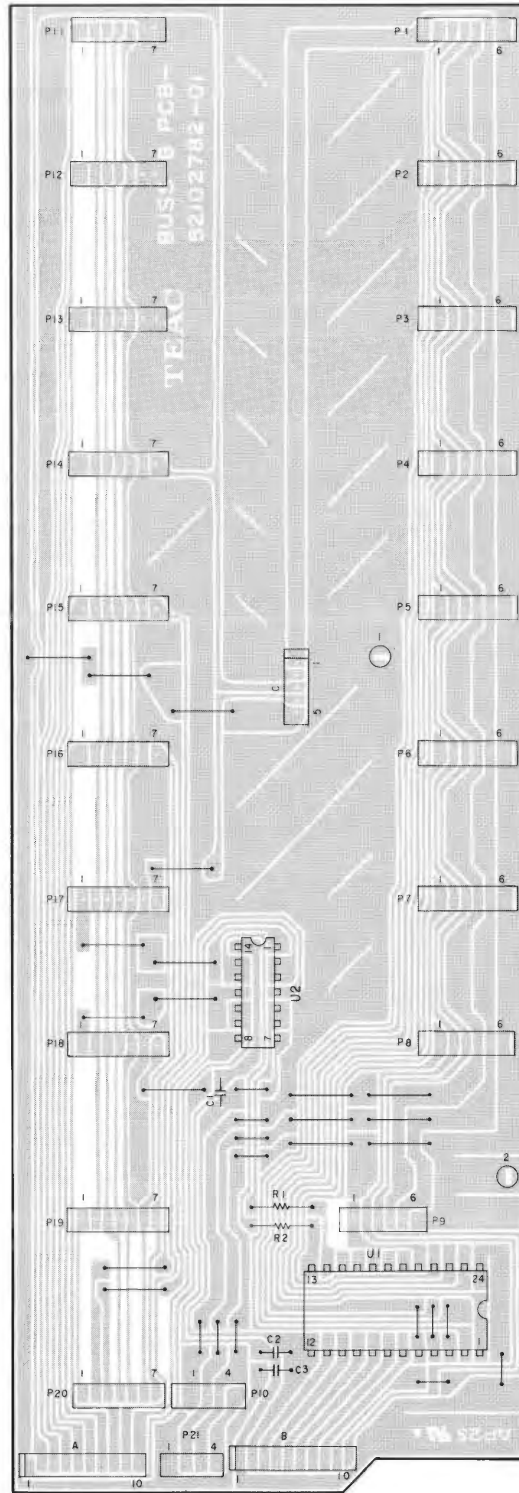


BUS - A PCB ASSY



BUSS - A

BUS - B PCB ASSY



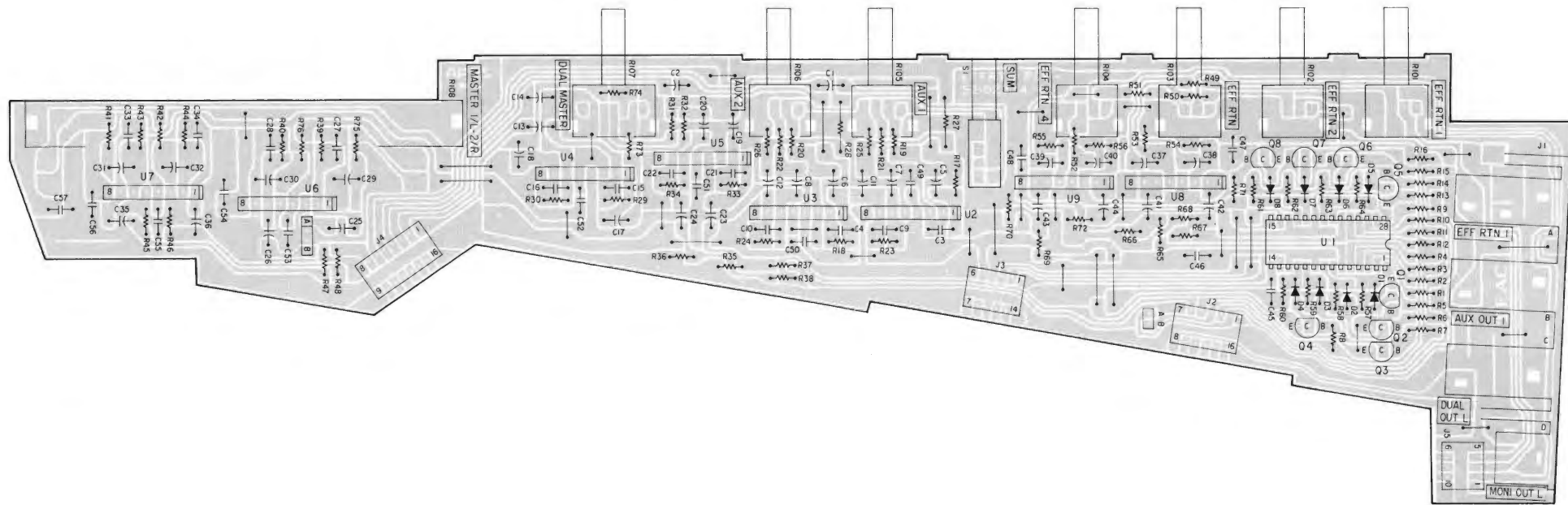
BUSS - B

BUS - C PCB ASSY

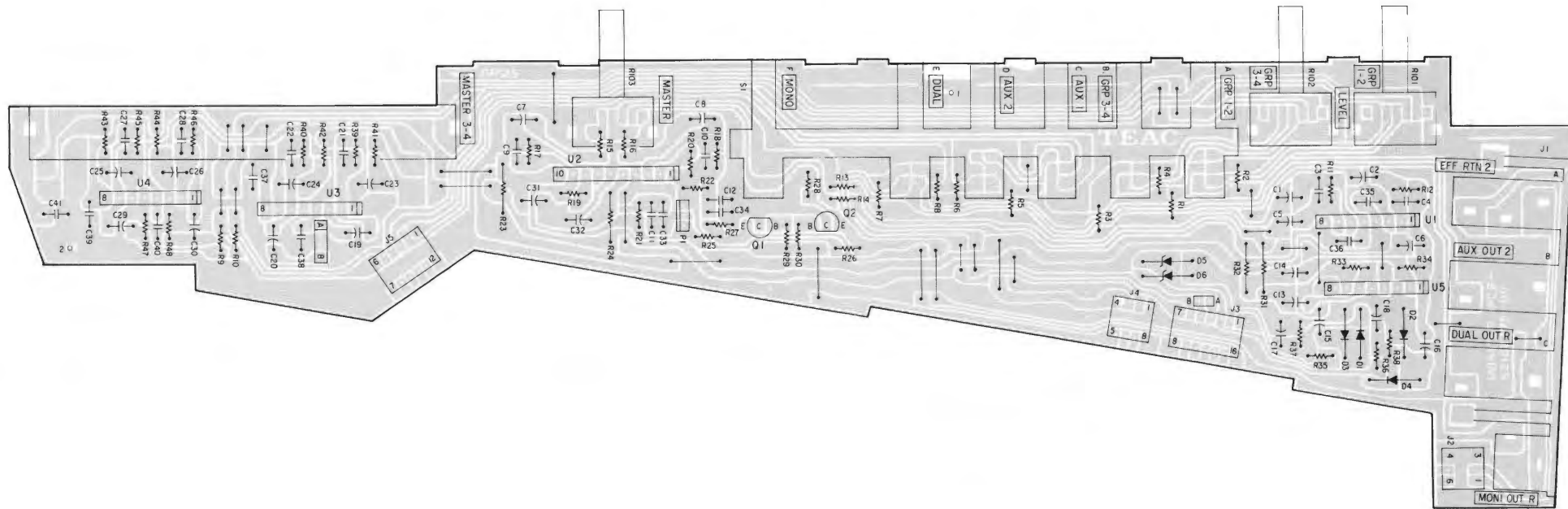


BUSS - C

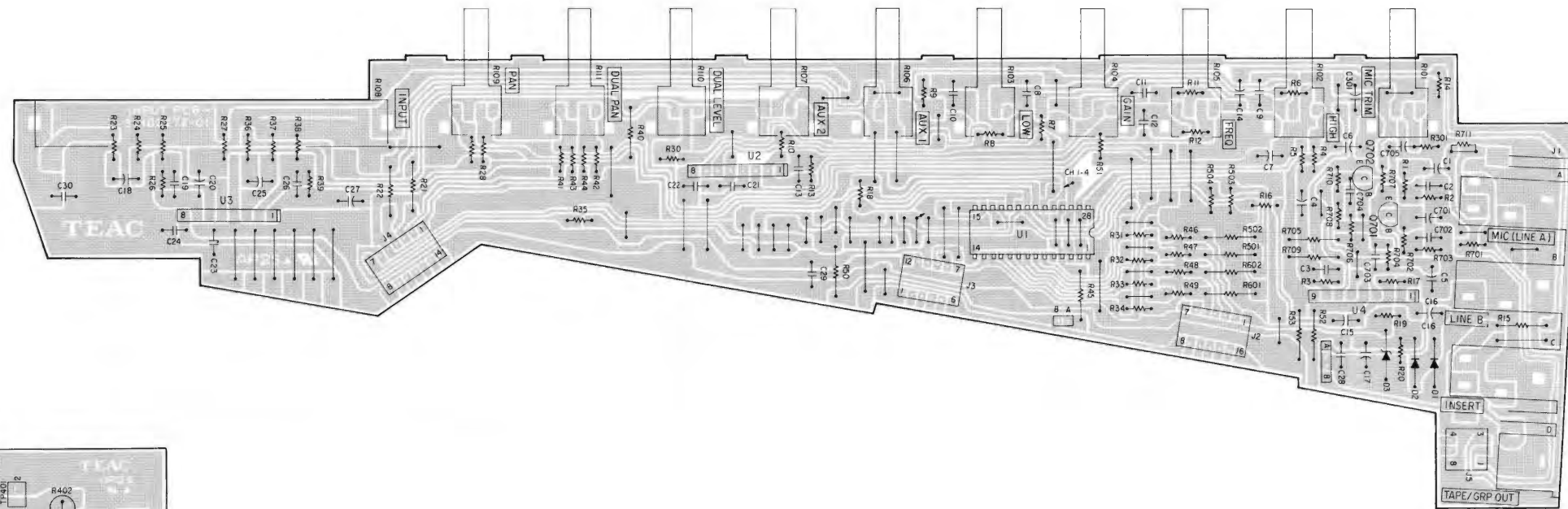
EFERTN PCB ASSY



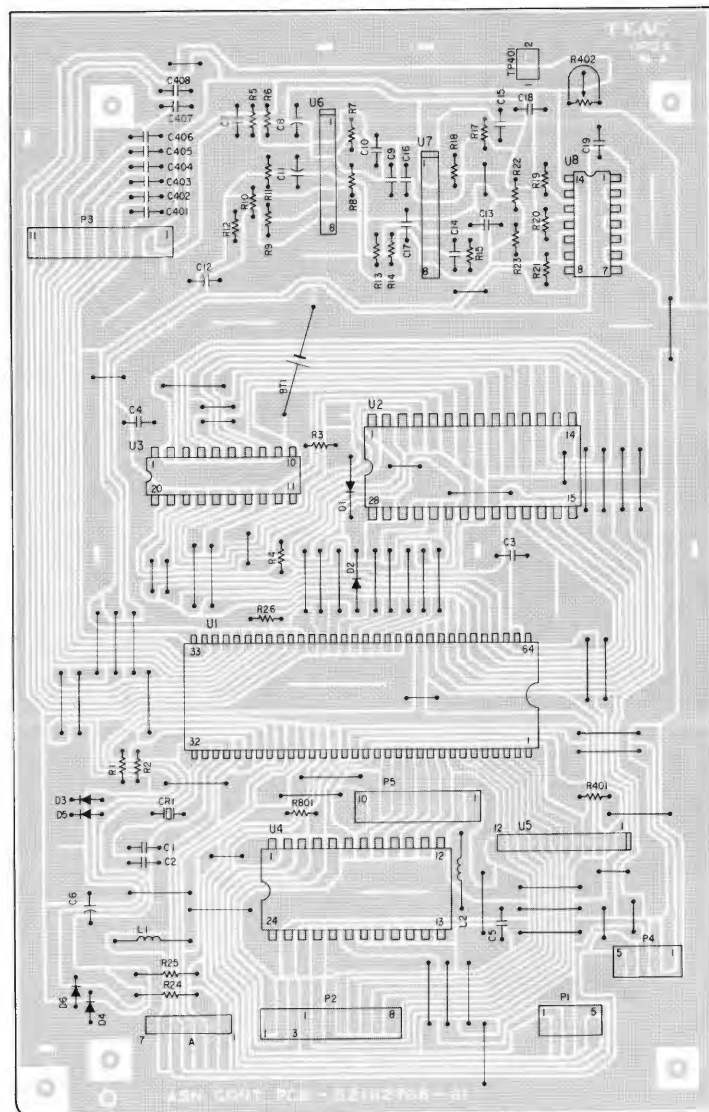
MONITOR PCB ASSY



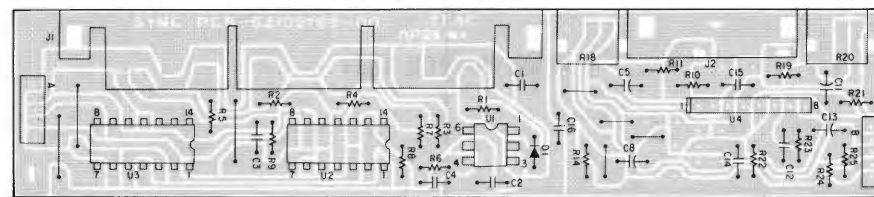
INPUT - PCB ASSY



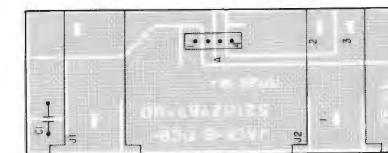
ASN CONT PCB ASSY



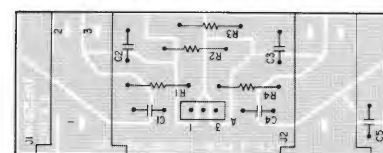
SYNC PCB ASSY



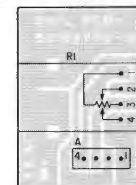
JACK - B PCB ASSY



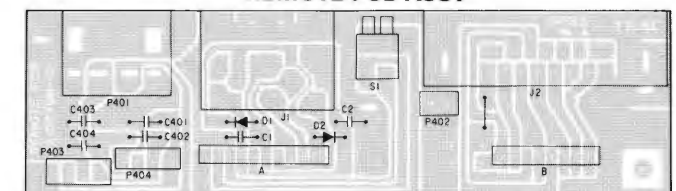
JACK - A PCB ASSY



SHTL PCB ASSY



REMOTE PCB ASSY





## PITCH CONT PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                  |
|---------|-------------|------------------------------|
|         | *5200278000 | PITCH CONT PCB ASSY          |
|         | *5210278000 | PITCH CONT PCB               |
|         | 5730018100  | CLIP, COATING CP-1S          |
|         | 5730018200  | CLIP, COATING CP-2S          |
| DI, 2   | 5224015020  | DIODE, ISSI33T-77            |
| D3      | 5224574701  | DIODE, ZENER RD8.2EL2 FR     |
| D4      | 5224015020  | DIODE, ISSI33T-77            |
| D5      | 5224016720  | DIODE, ISR35-200A FT         |
| D6, 7   | 5224015020  | DIODE, ISSI33T-77            |
| K1      | 5290013700  | RELAY, SY-12W-K              |
| P1      | 5336126500  | PLUG, CONN. 8263-0512(WHT)   |
| P2      | 5336249200  | PLUG, CONN. B02B-PH-K-S(WHT) |
| Q1      | 5232008420  | FET., 2SK381D                |
| R1, 2   | 5280035700  | R., TRIMMER 1KB              |
| R7      | 5282020700  | VR., ISIUVR 11, 1.5K(B)      |
| R20, 22 | 5280036700  | R., TRIMMER 47KB             |
| S1      | 5300052500  | SW., PUSH 2-2 SPUJ           |
| S2      | 5300916800  | SW., SLIDE 4-2 SSSU14        |
| S3      | 5300916700  | SW., SLIDE 2-3 SSSU          |
| U1      | 5232255720  | TR., DIGI. DTC124ES          |
| U2      | 5232254820  | TR., DIGI. DTA124ES          |
| U3      | 5232255720  | TR., DIGI. DTC124ES          |
| U4      | 5232254820  | TR., DIGI. DTA124ES          |
| U5      | 5220407200  | IC., LM2904                  |
| U6      | 5232255720  | TR., DIGI. DTC124ES          |
| U7      | 5232254820  | TR., DIGI. DTA124ES          |
| U8      | 5232255720  | TR., DIGI. DTC124ES          |
| U9      | 5232254820  | TR., DIGI. DTA124ES          |
| U10, 11 | 5232255720  | TR., DIGI. DTC124ES          |
| U12     | 5232254820  | TR., DIGI. DTA124ES          |
| U13     | 5220041100  | IC., BU4066B                 |

## LED PCB ASSY

| REF.NO. | PARTS NO.    | DESCRIPTION             |
|---------|--------------|-------------------------|
|         | *5200278101  | LED PCB ASSY            |
|         | *5210278101  | LED PCB                 |
|         | 5783033008   | SCREW, BIND S-TITE M3X8 |
|         | 5730018100   | CLIP, COATING CP-1S     |
| D1      | 5225021600   | LED, SLP277B-50         |
| D2, 3   | 5225021500   | LED, SLP177B-50         |
| D4      | 5225021700   | LED, SLP477B-50         |
| D5      | 5225021500   | LED, SLP177B-50         |
| D6-8    | 5224015020   | DIODE, ISSI33T-77       |
| D9      | 5224016720   | DIODE, ISR35-200A       |
| D10     | 5224015020   | DIODE, ISSI33T-77       |
| U1      | 5232255720   | TR., DIGI. DTC124ES     |
| U2      | 5232254820   | TR., DIGI. DTA124ES     |
| U3      | 5232255720   | TR., DIGI. DTC124ES     |
| U4      | △ 5220430300 | IC., L78MR05            |
| U5      | 5220425800   | IC., M5230LA            |
| U6      | 5232254820   | TR., DIGI. DTA124ES     |
| U7      | 5232255720   | TR., DIGI. DTC124ES     |
| U8      | 5232254820   | TR., DIGI. DTA124ES     |
| U9      | 5232255720   | TR., DIGI. DTC124ES     |

## SW PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION         |
|----------|-------------|---------------------|
|          | *5200276401 | SW PCB ASSY         |
|          | *5210276401 | SW PCB              |
|          | 5780003005  | SCREW, BIND M3X5    |
| DI       | 5225021700  | LED, SLP477B-50     |
| D2-11    | 5225021500  | LED, SLP177B-60     |
| D12      | 5225021600  | LED, SLP277B-50     |
| D13, 14  | 5225021500  | LED, SLP177B-60     |
| D15-71   | 5224015020  | DIODE, ISSI33T-77   |
| D401-403 | 5224015020  | DIODE, ISSI33T-77   |
| LCD1     | 5347013000  | ASSIGN(1), LCD      |
| LCD2     | 5347012900  | COUNTER, LCD        |
| S1       | 5300916600  | SW., SLIDE 2-4 SSSU |
| S2-16    | 5302108600  | SW., TACT SKHVBE    |
| S17      | 5302103200  | SW., TACT KHH10910  |
| S18      | 5302108600  | SW., TACT SKHVBE    |
| S19-21   | 5302103200  | SW., TACT KHH10910  |
| S22-24   | 5302108600  | SW., TACT SKHVBE    |
| S25      | 5302103200  | SW., TACT KHH10910  |
| S26-29   | 5302108600  | SW., TACT SKHVBE    |
| S30, 31  | 5302103200  | SW., TACT KHH10910  |
| S32      | 5302108600  | SW., TACT SKHVBE    |
| S33-37   | 5302103200  | SW., TACT KHH10910  |
| S38      | 5302108600  | SW., TACT SKHVBE    |
| S39      | 5302103200  | SW., TACT KHH10910  |
| S40-44   | 5302108600  | SW., TACT SKHVBE    |
| S45      | 5302103200  | SW., TACT KHH10910  |
| S46-57   | 5302108600  | SW., TACT SKHVBE    |
| U1-3     | 5220075000  | IC., LC7582A        |
| U4, 5    | 5220055900  | IC., TC74HC138P     |

## SYNC PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                  |
|---------|-------------|------------------------------|
|         | *5200276901 | SYNC PCB ASSY                |
|         | *5210276901 | SYNC PCB                     |
| DI      | 5224015020  | DIODE, ISSI33T-77            |
| J1      | 5334066300  | SOCKET, DIN 5PX3             |
| J2      | 5330513200  | JUCK, PIN 2P                 |
| P1      | 5336249500  | PLUG, CONN. B05B-PH-K-S(WHT) |
| R18, 20 | 5282020800  | VR., ISIUVR 09, 10K(A)       |
| U1      | 5228013300  | PHOTO-COUPLER, PC900MTS-30   |
| U2      | 5220059400  | IC., M74LS05P                |
| U3      | 5220015900  | IC., HD14011BP               |
| U4      | 5220444000  | IC., NJM4565L                |

Parts marked with \*require longer delivery time.

## R/P PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION                 |
|----------|-------------|-----------------------------|
|          | *5200276100 | R/P PCB ASSY                |
|          | *5210276100 | R/P PCB                     |
|          | 5730018100  | CLIP, COATING CP-1S         |
| DI       | 5224012920  | DIODE, 1S2473               |
| DI01-401 | 5224015020  | DIODE, ISS133T-77           |
| DI02-402 | 5224015020  | DIODE, ISS133T-77           |
| DI03-403 | 5224015020  | DIODE, ISS133T-77           |
| DI04-404 | 5224015020  | DIODE, ISS133T-77           |
| DI05-405 | 5224015020  | DIODE, ISS133T-77           |
| DI06-406 | 5224015020  | DIODE, ISS133T-77           |
| LI       | 5286029400  | COIL, CHOKE 10UH LAL04KB    |
| LI01-401 | 5286010200  | COIL, CHOKE 36MH            |
| LI02-402 | 5286029400  | COIL, CHOKE 10UH LAL04KB    |
| LI03-403 | 5286029400  | COIL, CHOKE 10UH LAL04KB    |
| PI       | 5336126800  | PLUG, CONN. 8263-0812(WHT)  |
| P2       | 5336126800  | PLUG, CONN. 8263-0812(WHT)  |
| PI01     | 5336126300  | PLUG, CONN. 8263-0312(WHT)  |
| P201     | 5336126300  | PLUG, CONN. 8263-0312(WHT)  |
| P301     | 5336126300  | PLUG, CONN. 8263-0312(WHT)  |
| P401     | 5336126300  | PLUG, CONN. 8263-0312(WHT)  |
| Q1       | 5230780920  | TR., 2SC2603F               |
| Q101-401 | 5231762020  | TR., 2SD1450S/T             |
| Q102-402 | 5230780920  | TR., 2SC2603F               |
| Q103-403 | 5231762020  | TR., 2SD1450S/T             |
| Q104-404 | 5231762020  | TR., 2SD1450S/T             |
| Q105-405 | 5230782200  | TR., 2SC2002L               |
| Q106-406 | 5230782200  | TR., 2SC2002L               |
| R107-407 | 5280021100  | R., TRIMMER 4.7KB           |
| RI13-413 | 5280021300  | R., TRIMMER 10KB            |
| RI26-426 | 5280021100  | R., TRIMMER 4.7KB           |
| RI28-428 | 5280021900  | R., TRIMMER 100KB           |
| RI42-442 | 5280021300  | R., TRIMMER 10KB            |
| TI       | 5320054800  | TRANS., OSC                 |
| TI01-401 | 5320054900  | TRANS., BIAS                |
| TI02-402 | 5320055000  | TRANS., ERASE               |
| UI       | 5232255720  | TR., DIGI. DTC124ES         |
| U41      | 5232254820  | TR., DIGI. DTA124ES         |
| UI01-401 | 5220435100  | IC., BA7755A                |
| UI02-402 | 5286023100  | COIL, TRAP 85KHZ            |
| UI03-403 | 5220439500  | IC., UPC4570HA              |
| UI04-404 | 5286037700  | FILTER, LOW PASS 20D4 20KHZ |
| UI05-405 | 5220075100  | IC., LC4066BS               |
| UI06-406 | 5220444000  | IC., NJM4565L               |
| UI07-407 | 5220432000  | IC., AN6292NK               |
| UI08-408 | 5242120000  | R., ARRAY IB15-5002         |
| UI09-409 | 5242120900  | R., ARRAY IB15-D002         |
| UI10-410 | 5292805000  | FILTER, LOW PASS 85KHZ      |
| UI11-411 | 5232255720  | TR., DIGI. DTC124ES         |
| UI12-412 | 5232256820  | TR., DIGI. DTB143ES         |
| UI13-413 | 5232256820  | TR., DIGI. DTB143ES         |
| UI14-414 | 5232254820  | TR., DIGI. DTA124ES         |
| UI15-415 | 5232255720  | TR., DIGI. DTC124ES         |

## MECHA CONT PCB ASSY

| REF.NO.  | PARTS NO.    | DESCRIPTION                  |
|----------|--------------|------------------------------|
|          | *5200276201  | MECHA CONT PCB ASSY          |
|          | *5210276200  | MECHA CONT PCB               |
|          | 5730018200   | CLIP, COATING CP-2S          |
| CR1      | 5347009900   | OSC., CERAMIC 4.9152MHZ      |
| DI, 2    | 5224015020   | DIODE, ISS133T-77            |
| D3       | 5224574401   | DIODE, ZENER RD7.5EL2        |
| D4-11    | 5224015020   | DIODE, ISS133T-77            |
| D12      | 5224016720   | DIODE, ISR35-200A FT         |
| D13-16   | 5224015020   | DIODE, ISS133T-77            |
| D17      | 5224016720   | DIODE, ISR35-200A            |
| D401-403 | 5224015020   | DIODE, ISS133T-77            |
| D404     | 5224571801   | DIODE, ZENER RD3.0FL2        |
| D405     | 5224574701   | DIODE, ZENER RD8.2EL2        |
| D406     | 5224015020   | DIODE, ISS133T-77            |
| LI, 2    | 5286027400   | COIL, CHOKE 0.22UH LAL04NA   |
| P1       | 5336249700   | PLUG, CONN. B07B-PH-K-S(WHT) |
| P2       | 5336249800   | PLUG, CONN. B08B-PH-K-S(WHT) |
| P3       | 5336251400   | PLUG, CONN. B04B-PH-K-R(RED) |
| P4       | 5336252000   | PLUG, CONN. B10B-PH-K-R(RED) |
| P5       | 5336127000   | PLUG, CONN. 8263-1012(WHT)   |
| P6       | 5336250000   | PLUG, CONN. B10B-PH-K-S(WHT) |
| P7       | 5336250100   | PLUG, CONN. B11B-PH-K-S(WHT) |
| P8       | 5336249600   | PLUG, CONN. B06B-PH-K-S(WHT) |
| P9       | 5336126500   | PLUG, CONN. 8263-0512(WHT)   |
| P10      | 5336249400   | PLUG, CONN. B04B-PH-K-S(WHT) |
| P11      | 5336126400   | PLUG, CONN. 8263-0412(WHT)   |
| P12      | 5336126700   | PLUG, CONN. 8263-0712(WHT)   |
| P13      | 5336249300   | PLUG, CONN. B03B-PH-K-S(WHT) |
| P401     | 5336249800   | PLUG, CONN. B08B-PH-K-S(WHT) |
| Q1, 2    | 5230780920   | TR., 2SC2603F                |
| Q401     | 5232008420   | FET., 2SK381D                |
| RI5      | 5280021900   | R., TRIMMER 100KB            |
| R21      | 5280021900   | R., TRIMMER 100KB            |
| R24      | △ 5241270510 | R., NONFLAMMABLE 1W 1 OHM    |
| R25      | △ 5241283710 | R., NONFLAMMABLE 2W 22 OHM   |
| R26      | △ 5241282910 | R., NONFLAMMABLE 2W 10 OHM   |
| U1       | 5220817500   | IC., UPD75P116CW             |
| U2       | 5242119100   | R., ARRAY RYLS8J103          |
| U3       | 5242121800   | R., ARRAY RYLS-4J103         |
| U4       | 5220075200   | IC., M751701P                |
| U5-7     | 5232256820   | TR., DIGI. DTB143ES          |
| U8       | 5242122000   | R., ARRAY RYLS-7J103         |
| U9, 10   | 5232255720   | TR., DIGI. DTC124ES          |
| U11, 12  | 5220427800   | IC., BA6209                  |
| U13, 14  | 5232255720   | TR., DIGI. DTC124ES          |
| U15      | 5220426300   | IC., BA6993                  |
| U16, 17  | 5232255720   | TR., DIGI. DTC124ES          |
| U18      | 5232256820   | TR., DIGI. DTB143ES          |
| U19      | 5232255720   | TR., DIGI. DTC124ES          |
| U20      | 5232254820   | TR., DIGI. DTA124ES          |
| U401-404 | 5232254820   | TR., DIGI. DTA124ES          |
| U405-413 | 5232255720   | TR., DIGI. DTC124ES          |

Parts marked with \*require longer delivery time.

## ASN CONT PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                  |
|---------|-------------|------------------------------|
|         | *5200276501 | ASN CONT PCBA                |
|         | *5210276501 | ASN CONT PCB                 |
|         | 5730018200  | CLIP, COATING CP-2S          |
| BT1     | 5347013100  | BATTERY, LITHIUM CR2430-FT10 |
| CR1     | 5347013200  | OSC., CERAMIC CSA12.0MT      |
| D1,2    | 5224016510  | DIODE, SIS3M-01P10           |
| D3-6    | 5224015020  | DIODE, ISSI33T-77            |
| L1,2    | 5286029400  | COIL, CHOKE 10UH LAL04KB     |
| P1      | 5336251500  | PLUG, CONN. B05B-PH-K-R(RED) |
| P2,3    | 5336250100  | PLUG, CONN. B11B-PH-K-S(WHT) |
| P4      | 5336249500  | PLUG, CONN. B05B-PH-K-S(WHT) |
| P5      | 5336250000  | PLUG, CONN. B10B-PH-K-S(WHT) |
| R402    | 5280021300  | R., TRIMMER 10KB             |
| TP401   | 5336126200  | PLUG, CONN. 8263-0212(WHT)   |
| U1      | 5220817300  | IC., UPD78C12ACW             |
| U2      | 5220814900  | LSI., HM6264ALP-15L          |
| U3      | 5220052800  | IC., TC74HC373P              |
| U4      | 5220806200  | IC, M5L8243P                 |
| U5      | 5242122300  | R., ARRAY RYLS-11J103        |
| U6,7    | 5220442900  | IC., M5223L                  |
| U8      | 5220017200  | IC., HD14069UBP              |

## REMOTE PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                |
|---------|-------------|----------------------------|
|         | *5200276801 | REMOTE PCB ASSY            |
|         | *5210276801 | REMOTE PCB                 |
|         | 5730018200  | CLIP, COATING CP-2S        |
| D1,2    | 5224015020  | DIODE, ISSI33T-77          |
| J1      | 5334045400  | SOCKET, DIN 8P YKF51-5001  |
| J2      | 5334055000  | SOCKET, CONN. 15P          |
| P401    | 5332021100  | INLET, 4P                  |
| P402    | 5336126200  | PLUG, CONN. 8263-0212(WHT) |
| P403    | 5336126400  | PLUG, CONN. 8263-0412(WHT) |
| P404    | 5336135400  | PLUG, CONN. 8263-0412(RED) |
| S1      | 5302107500  | SW., DIP 2GANG KSP02B      |

## SENSOR PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                |
|---------|-------------|----------------------------|
|         | *5200275000 | SENSOR PCB ASSY            |
|         | *5210275000 | SENSOR PCB                 |
|         | 5800735900  | SPACER                     |
| Q1 Q2   | 5228013100  | PHOTO REFLEC., NJL5141EA-B |
| RT1     | 5228015700  | THERMISTOR, SDT-09 90 OHM  |
| RT2     | 5228015400  | THERMISTOR, SDT-02 20 OHM  |

## SHTL PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION         |
|---------|-------------|---------------------|
|         | *5200293600 | SHTL PCB ASSY       |
|         | *5210293600 | SHTL PCB            |
| R1      | 5282018800  | VR., IS1UVR 11 20KW |

## MONITOR PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION                  |
|----------|-------------|------------------------------|
|          | *5200277500 | MONITOR PCB ASSY             |
|          | *5210277500 | MONITOR PCB                  |
|          | 5730018100  | CLIP, COATING CP-1S          |
|          | 5730018200  | CLIP, COATING CP-2S          |
| D1-4     | 5224012800  | DIODE, 0A90R                 |
| D5,6     | 5224572001  | DIODE, ZENER RD3.3EL2 FR     |
| J1       | 5330015300  | JACK, B                      |
| J2       | 5336281300  | SOCKET, CONNECT. 3P          |
| J3       | 5336281700  | SOCKET, CONNECT. 7P          |
| J4       | 5336281400  | SOCKET, CONNECT. 4P          |
| J5       | 5336281600  | SOCKET, CONNECT. 6P          |
| P1       | 5336249300  | PLUG, CONN. B03B-PH-K-S(WHT) |
| Q1,2     | 5231762020  | TR., 2SD1450S/T              |
| R101-103 | 5282415200  | VR., IS2UVR 14, 10K(A)X2     |
| R104     | 5284014300  | VR., SLIDE 10K(A)X2 60       |
| R23,24   | 5184123000  | R., INCOMB. 8.2 OHM          |
| S1       | 5300052600  | SW., PUSH 6G 2-2 SPUJ        |
| U1       | 5220444000  | IC., NJM4565L                |
| U2       | 5220441700  | IC., TA7272P                 |
| U3-5     | 5220444000  | IC., NJM4565L                |

## EFFRTN PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION            |
|----------|-------------|------------------------|
|          | *5200277400 | EFFRTN PCB ASSY        |
|          | *5210277400 | EFFRTN PCB             |
| D1-8     | 5224015020  | DIODE, ISSI33T-77      |
| J1       | 5330015300  | JACK, B                |
| J2       | 5336281700  | SOCKET, CONNECT. 7P    |
| J3       | 5336281600  | SOCKET, CONNECT. 6P    |
| J4       | 5336281800  | SOCKET, CONNECT. 8P    |
| J5       | 5336281500  | SOCKET, CONNECT. 5P    |
| Q1-8     | 5232008420  | FET., 2SK381D          |
| R101-106 | 5282020500  | VR., IS1UVR 11, 20K(A) |
| R107     | 5282415200  | IS2UVR 14, 10K(A)X2    |
| R108     | 5284014300  | VR., SLIDE 10K(A)X2 60 |
| S1       | 5300052500  | SW., PUSH 2-2 SPUJ     |
| U1       | 5220075300  | IC., TC9164N           |
| U2-9     | 5220444000  | IC., NJM4565L          |

Parts marked with \*require longer delivery time.

## INPUT-1 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277201 | INPUT-1 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK(A),4P              |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| R101     | 5282020900  | VR.,IS1UVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,IS1UVR 11,100K(B)   |
| R104     | 5282020200  | VR.,IS1UVR 11,10K(B)    |
| R105     | 5282415300  | VR.,IS2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,IS1UVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| R110     | 5282020500  | VR.,IS1UVR 11,20K(A)    |
| R111     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

## INPUT-5 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277221 | INPUT-5 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK,A                  |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| R101     | 5282020900  | VR.,IS1UVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,IS1UVR 11,100K(B)   |
| R104     | 5282020200  | VR.,IS1UVR 11,10K(B)    |
| R105     | 5282415300  | VR.,IS2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,IS1UVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| R110     | 5282020500  | VR.,IS1UVR 11,20K(A)    |
| R111     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

## INPUT-4 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277211 | INPUT-4 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK,A                  |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| R101     | 5282020900  | VR.,IS1UVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,IS1UVR 11,100K(B)   |
| R104     | 5282020200  | VR.,IS1UVR 11,10K(B)    |
| R105     | 5282415300  | VR.,IS2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,IS1UVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| R110     | 5282020500  | VR.,IS1UVR 11,20K(A)    |
| R111     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

## INPUT-6 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277231 | INPUT-6 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK,A                  |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| R101     | 5282020900  | VR.,IS1UVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,IS1UVR 11,100K(B)   |
| R104     | 5282020200  | VR.,IS1UVR 11,10K(B)    |
| R105     | 5282415300  | VR.,IS2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,IS1UVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| R110     | 5282020500  | VR.,IS1UVR 11,20K(A)    |
| R111     | 5282020600  | VR.,IS1UVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

Parts marked with \*require longer delivery time.

## INPUT-7 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277241 | INPUT-7 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK,A                  |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| J5       | 5336281300  | SOCKET,CONN. 3P         |
| Q701,702 | 5145119000  | TR.,2SC-1844F           |
| R101     | 5282020900  | VR.,1SIUVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,1SIUVR 11,100K(B)   |
| R104     | 5282020200  | VR.,1SIUVR 11,10K(B)    |
| R105     | 5282415300  | VR.,1S2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,1SIUVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,1SIUVR 11,5K(B)     |
| R110     | 5282020500  | VR.,1SIUVR 11,20K(A)    |
| R111     | 5282020600  | VR.,1SIUVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

## INPUT-8 PCB ASSY

| REF.NO.  | PARTS NO.   | DESCRIPTION             |
|----------|-------------|-------------------------|
|          | *5200277251 | INPUT-8 PCB ASSY        |
|          | *5210277201 | INPUT PCB               |
| D1,2     | 5224012800  | DIODE,0A90R             |
| D3       | 5224572001  | DIODE,ZENER RD3.3EL2    |
| J1       | 5330015200  | JACK,A                  |
| J2,4     | 5336281700  | SOCKET,CONN. 7P         |
| J3       | 5336281600  | SOCKET,CONN. 6P         |
| J5       | 5336281300  | SOCKET,CONN. 3P         |
| Q701,702 | 5145119000  | TR.,2SC-1844F           |
| R101     | 5282020900  | VR.,1SIUVR 11,10K(RD)   |
| R102,103 | 5282020100  | VR.,1SIUVR 11,100K(B)   |
| R104     | 5282020200  | VR.,1SIUVR 11,10K(B)    |
| R105     | 5282415300  | VR.,1S2UVR 11,200K(C)X2 |
| R106,107 | 5282020400  | VR.,1SIUVR 11,20K(W)    |
| R108     | 5284014200  | VR.,SLIDE 10K(A)        |
| R109     | 5282020600  | VR.,1SIUVR 11,5K(B)     |
| R110     | 5282020500  | VR.,1SIUVR 11,20K(A)    |
| R111     | 5282020600  | VR.,1SIUVR 11,5K(B)     |
| U1       | 5220075300  | IC.,TC9164N             |
| U2,3     | 5220444000  | IC.,NJM4565L            |
| U4       | 5220439500  | IC.,UPC4570HA           |

## JACK-A PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION             |
|---------|-------------|-------------------------|
|         | *5200276600 | JACK-A PCB ASSY         |
|         | *5210276600 | JACK-A PCB              |
| J1,2    | 5330015500  | JACK,3P YKB21-5155(RED) |

## JACK-B PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION            |
|---------|-------------|------------------------|
|         | *5200276701 | JACK-B PCB ASSY        |
|         | *5210276701 | JACK-B PCB             |
| J1      | 5330014800  | JACK,SINGLE YKB21-5014 |
| J2      | 5330011600  | JACK,3P YKB21-5010     |

## JACK-L PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                  |
|---------|-------------|------------------------------|
|         | *5200278300 | JACK-L PCB ASSY              |
|         | *5210278301 | JACK-L PCB                   |
| J1      | 5330015400  | JACK,SINGLE                  |
| J2      | 5334066400  | SOCKET,XLR CONN. HA16PRM-3SA |
| J3      | 5336281500  | SOCKET,CONN. 5P IL-SDA-S     |

## JACK-R PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                  |
|---------|-------------|------------------------------|
|         | *5200278400 | JACK-R PCB ASSY              |
|         | *5210278401 | JACK-R PCB                   |
| J1      | 5330015400  | JACK,SINGLE                  |
| J2      | 5334066500  | SOCKET,XLR CONN. HA16PRM-3SD |
| J3      | 5336281600  | SOCKET,CONN. 6P IL-SDA-S     |

## BUSS-A PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION                |
|---------|-------------|----------------------------|
|         | *5200277601 | BUSS-A PCB ASSY            |
|         | *5210277601 | BUSS-A PCB                 |
| PI-8    | 5336279700  | PLUG,CONN. 7P IL-SDA-P     |
| P9      | 5336279800  | PLUG,CONN. 8P IL-SDA-P     |
| PI0     | 5336279600  | PLUG,CONN. 6P IL-SDA-P     |
| PI1     | 5336291500  | PLUG,CONN. S5B-PH-K-R(RED) |
| PI2     | 5336287500  | PLUG,CONN. S5B-PH-K-S(WHT) |

Parts marked with \*require longer delivery time.

## BUSS-B PCB ASSY

| REF.NO. | PARTS NO.   | DESCRIPTION             |
|---------|-------------|-------------------------|
|         | *5200278201 | BUSS-B PCB ASSY         |
|         | *5210278201 | BUSS-B PCB              |
|         | 5730018100  | CLIP, COATING CP-1S     |
| P1-9    | 5336279600  | PLUG, CONN. 6P IL-SDA-P |
| P10     | 5336279400  | PLUG, CONN. 4P IL-SDA-P |
| P11-20  | 5336279700  | PLUG, CONN. 7P IL-SDA-P |
| P21     | 5336126400  | PLUG, CONN. 4P IL-SDA-P |
| U1      | 5220806200  | IC, M5L8243P            |
| U2      | 5220021600  | IC., M4066BP            |

## BUSS-C PCB ASSY

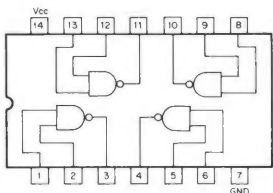
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|---------|-------------|-------------------------|
|         | *5200277700 | BUSS-C PCB ASSY         |
|         | *5210277700 | BUSS-C PCB              |
| P1, 2   | 5336279300  | PLUG, CONN. 3P IL-SDA-P |
| P3      | 5336279500  | PLUG, CONN. 5P IL-SDA-P |
| P4      | 5336279300  | PLUG, CONN. 3P IL-SDA-P |
| P5      | 5336279500  | PLUG, CONN. 5P IL-SDA-P |
| P6      | 5336279600  | PLUG, CONN. 6P IL-SDA-P |

Parts marked with \*require longer delivery time.

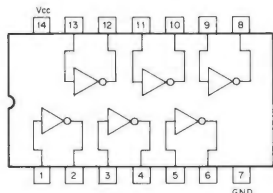
# 11. IC BLOCK DIAGRAM

## ICブロック・ダイアグラム

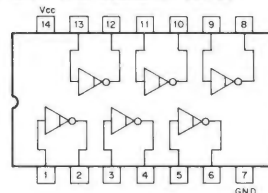
HD14011BP  
QUAD 2-INPUT NAND GATES



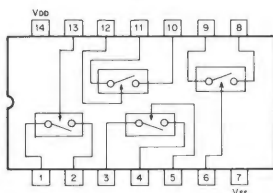
HD14069UBP  
HEX INVERTERS



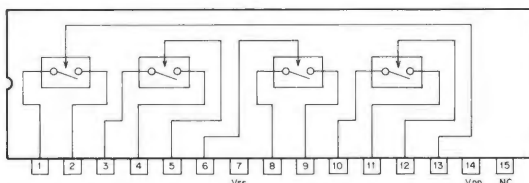
M74LS05P  
HEX INVERTERS  
WITH OPEN COLLECTOR OUTPUT



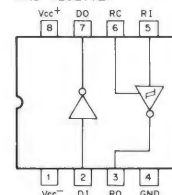
BU4066B  
M4066BP  
QUAD BILATERAL SWITCHES



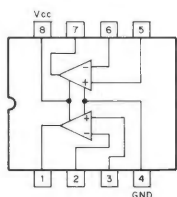
LC4066BS  
QUAD BILATERAL SWITCHES



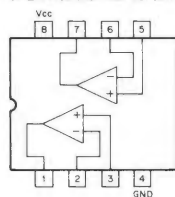
M751701P  
RS-232C LINE DRIVER  
AND RECEIVER



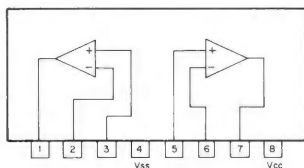
BA6993  
DUAL COMPARATOR



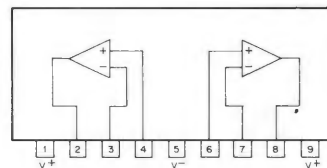
LM2904N  
DUAL SINGLE SUPPLY  
OPERATIONAL AMPLIFIERS



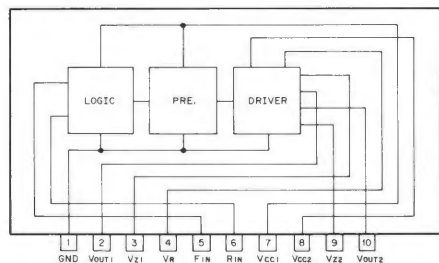
NJM4565L  
DUAL OPERATIONAL AMPLIFIERS



μPC4570HA  
DUAL OPERATIONAL AMPLIFIERS

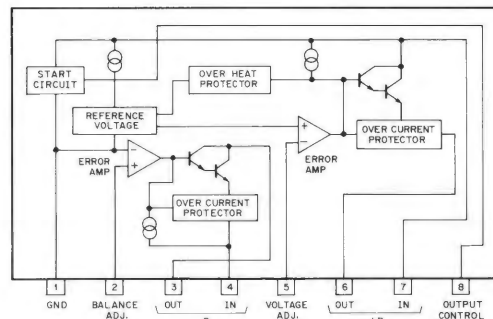


BA6209  
MOTOR INVERTING IC

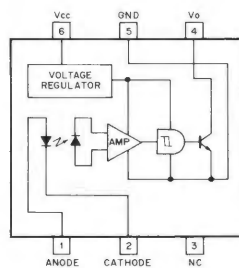


| FIN | RIN | VOUT1 | VOUT2 |
|-----|-----|-------|-------|
| H   | H   | L     | L     |
| L   | H   | L     | H     |
| H   | L   | H     | L     |
| L   | L   | L     | L     |

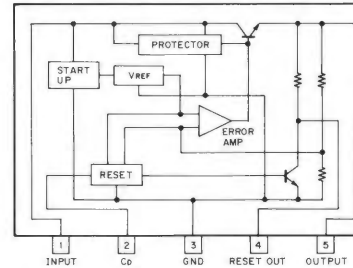
M5230LA  
VOLTAGE REGULATOR



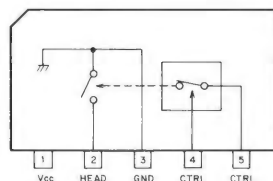
PC900  
DIGITAL OUTPUT TYPE  
OPIC PHOTOCOUPLER



L78MR05  
VOLTAGE REGULATOR  
WITH RESET OUTPUT

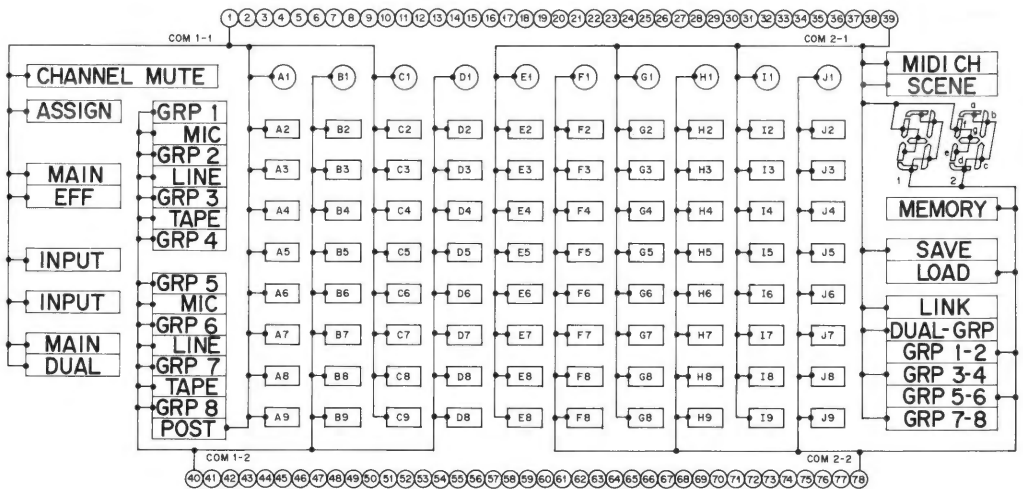
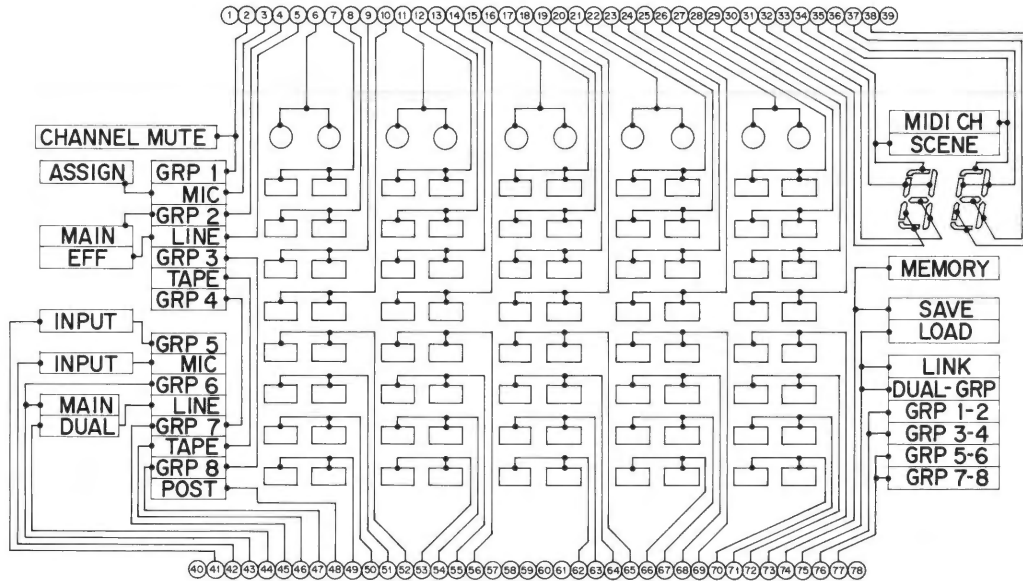
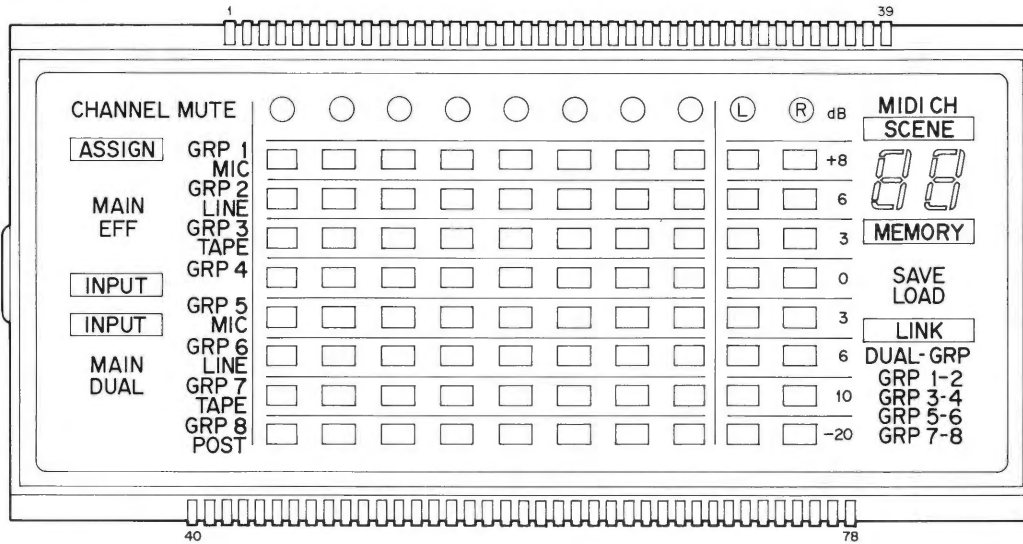


BA7755  
AUDIO HEAD SWITCHER



| CTRL 1 | CTRL 2 | HEAD SW |
|--------|--------|---------|
| L      | L      | ON      |
| L      | H      | OFF     |

LCD-8062PR1  
LCD ASSIGN (1)

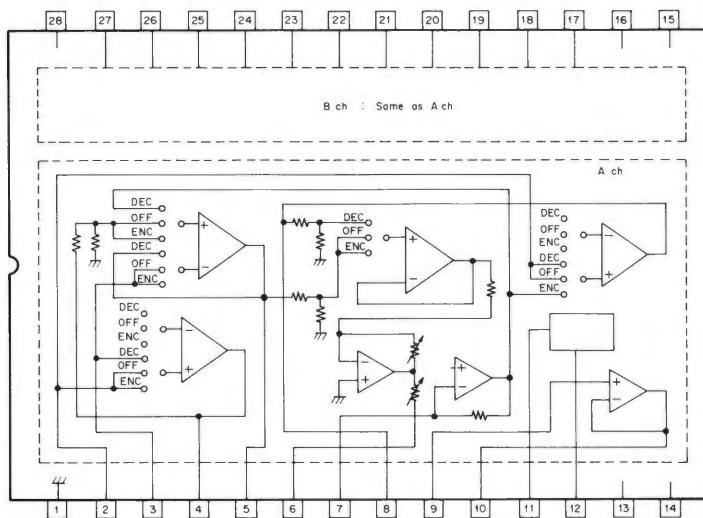


| Pin | COM 1-1           | COM 1-2 | COM 2-1            | COM 2-2 |
|-----|-------------------|---------|--------------------|---------|
| 1   | COM 1-1           | ---     | ---                | ---     |
| 2   | CHANNEL MUTE      | GRP 1   | ---                | ---     |
| 3   | ASSIGN (U) MIC    | ---     | ---                | ---     |
| 4   | (U) MAIN          | GRP 2   | ---                | ---     |
| 5   | EFF (U) LINE      | ---     | ---                | ---     |
| 6   | A1                | B1      | ---                | ---     |
| 7   | A2                | B2      | ---                | ---     |
| 8   | A3                | B3      | ---                | ---     |
| 9   | A4                | B4      | ---                | ---     |
| 10  | A5                | B5      | ---                | ---     |
| 11  | C1                | D1      | ---                | ---     |
| 12  | C2                | D2      | ---                | ---     |
| 13  | C3                | D3      | ---                | ---     |
| 14  | C4                | D4      | ---                | ---     |
| 15  | C5                | D5      | ---                | ---     |
| 16  | ---               | ---     | E1                 | F1      |
| 17  | ---               | ---     | E2                 | F2      |
| 18  | ---               | ---     | E3                 | F3      |
| 19  | ---               | ---     | E4                 | F4      |
| 20  | ---               | ---     | E5                 | F5      |
| 21  | ---               | ---     | G1                 | H1      |
| 22  | ---               | ---     | G2                 | H2      |
| 23  | ---               | ---     | G3                 | H3      |
| 24  | ---               | ---     | G4                 | H4      |
| 25  | ---               | ---     | G5                 | H5      |
| 26  | ---               | ---     | I1                 | J1      |
| 27  | ---               | ---     | I2                 | J2      |
| 28  | ---               | ---     | I3                 | J3      |
| 29  | ---               | ---     | I4                 | J4      |
| 30  | ---               | ---     | I5                 | J5      |
| 31  | ---               | ---     | I6                 | I6      |
| 32  | ---               | ---     | I7                 | I7      |
| 33  | ---               | ---     | I8                 | I8      |
| 34  | ---               | ---     | SCENE              | I9      |
| 35  | ---               | ---     | MIDI CH            | 2a      |
| 36  | ---               | ---     | 2f                 | 2b      |
| 37  | ---               | ---     | 2g                 | 2c      |
| 38  | ---               | ---     | 2e                 | 2d      |
| 39  | ---               | ---     | COM 2-1            | ---     |
| 40  | ---               | ---     | COM 1-2            | ---     |
| 41  | (U) INPUT         | GRP 5   | ---                | ---     |
| 42  | (L) INPUT (L) MIC | ---     | ---                | ---     |
| 43  | (L) MAIN          | GRP 6   | ---                | ---     |
| 44  | DUAL (L) LINE     | ---     | ---                | ---     |
| 45  | GRP 7             | GRP 4   | ---                | ---     |
| 46  | (L) TAPE (U) TAPE | ---     | ---                | ---     |
| 47  | GRP 8             | GRP 3   | ---                | ---     |
| 48  | POST              | ---     | ---                | ---     |
| 49  | A9                | B9      | ---                | ---     |
| 50  | A8                | B8      | ---                | ---     |
| 51  | A7                | B7      | ---                | ---     |
| 52  | A6                | B6      | ---                | ---     |
| 53  | C9                | D9      | ---                | ---     |
| 54  | C8                | D8      | ---                | ---     |
| 55  | C7                | D7      | ---                | ---     |
| 56  | C6                | D6      | ---                | ---     |
| 57  | ---               | ---     | ---                | ---     |
| 58  | ---               | ---     | ---                | ---     |
| 59  | ---               | ---     | ---                | ---     |
| 60  | ---               | ---     | ---                | ---     |
| 61  | ---               | ---     | ---                | ---     |
| 62  | ---               | ---     | E9                 | F9      |
| 63  | ---               | ---     | E8                 | F8      |
| 64  | ---               | ---     | E7                 | F7      |
| 65  | ---               | ---     | E6                 | F6      |
| 66  | ---               | ---     | G9                 | H9      |
| 67  | ---               | ---     | G8                 | H8      |
| 68  | ---               | ---     | G7                 | H7      |
| 69  | ---               | ---     | G6                 | H6      |
| 70  | ---               | ---     | I9                 | J9      |
| 71  | ---               | ---     | I8                 | J8      |
| 72  | ---               | ---     | I7                 | J7      |
| 73  | ---               | ---     | I6                 | J6      |
| 74  | ---               | ---     | SAVE MEMORY        | ---     |
| 75  | ---               | ---     | LINK DUAL-GRP LOAD | ---     |
| 76  | ---               | ---     | GRP 3-4            | GRP 1-2 |
| 77  | ---               | ---     | GRP 7-8            | GRP 5-6 |
| 78  | ---               | ---     | ---                | COM 2-2 |

(U) : UPPER  
(L) : LOWER

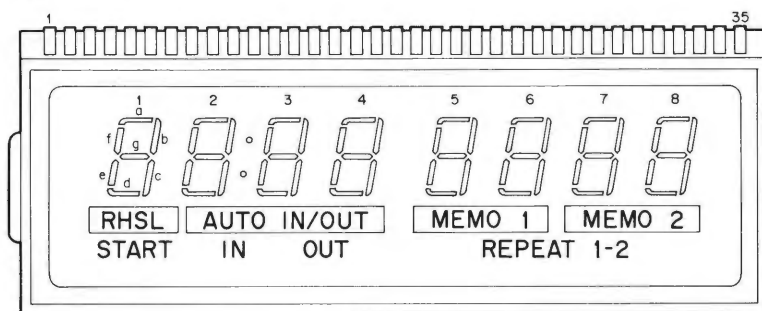


## AN6292NK DUAL dbx NOISE REDUCTION PROCESSOR

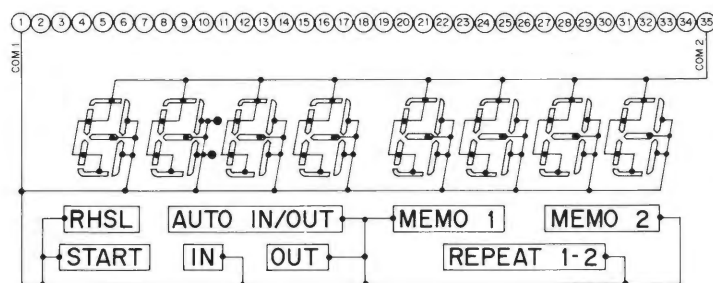
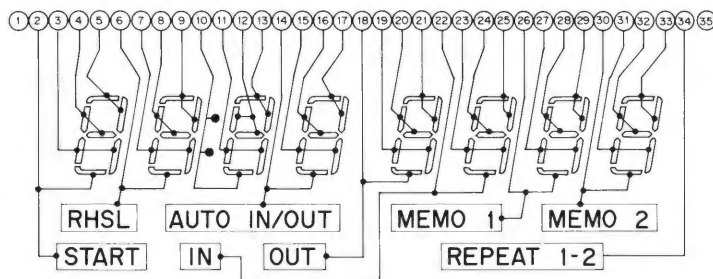


|    |                     |      |
|----|---------------------|------|
| 1  | GND                 |      |
| 2  | SIGNAL INPUT        | A ch |
| 3  | EMPHASIS            |      |
| 4  | LINE AMP OUTPUT     |      |
| 5  | EMPHASIS AMP OUTPUT |      |
| 6  | SWITCH OUTPUT       |      |
| 7  | CCA INPUT           |      |
| 8  | REC AMP OUTPUT      |      |
| 9  | BUFFER AMP INPUT    |      |
| 10 | BUFFER AMP OUTPUT   |      |
| 11 | LEVEL SENSOR INPUT  |      |
| 12 | TIMING CAPACITOR    |      |
| 13 | TIMING CURRENT ADJ. |      |
| 14 | -B POWER SUPPLY     |      |
| 15 | dbx ON / OFF        |      |
| 16 | ENCODE / DECODE     |      |
| 17 | TIMING CAPACITOR    | B ch |
| 18 | LEVEL SENSOR INPUT  |      |
| 19 | BUFFER AMP OUTPUT   |      |
| 20 | BUFFER AMP INPUT    |      |
| 21 | REC AMP OUTPUT      |      |
| 22 | CCA INPUT           |      |
| 23 | SWITCH OUTPUT       |      |
| 24 | EMPHASIS AMP OUTPUT |      |
| 25 | LINE AMP OUTPUT     |      |
| 26 | EMPHASIS            |      |
| 27 | SIGNAL INPUT        |      |
| 28 | +B POWER SUPPLY     |      |

## LCD - 8061 PR LCD COUNTER



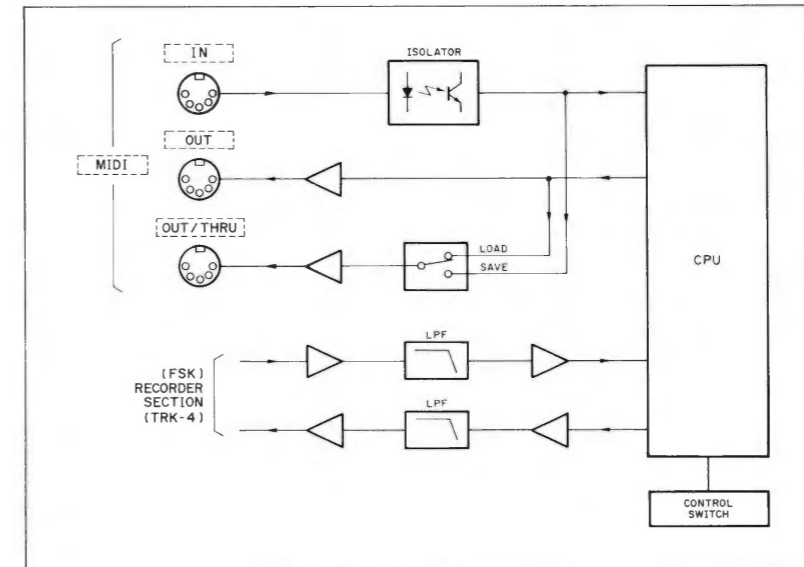
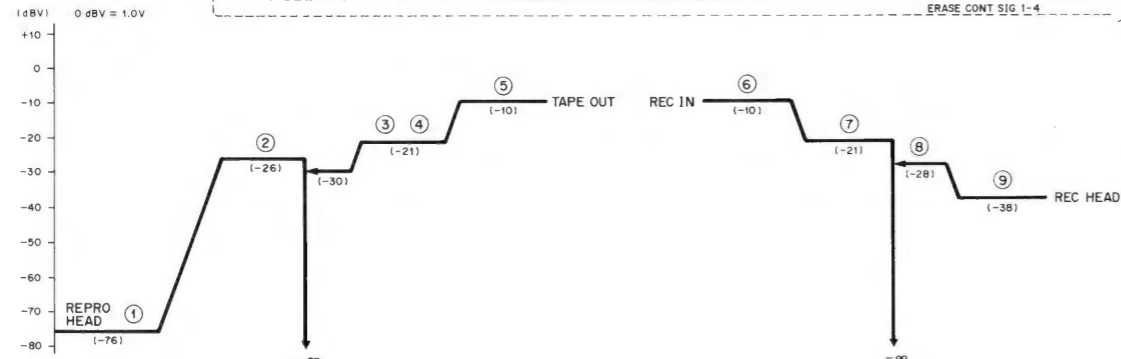
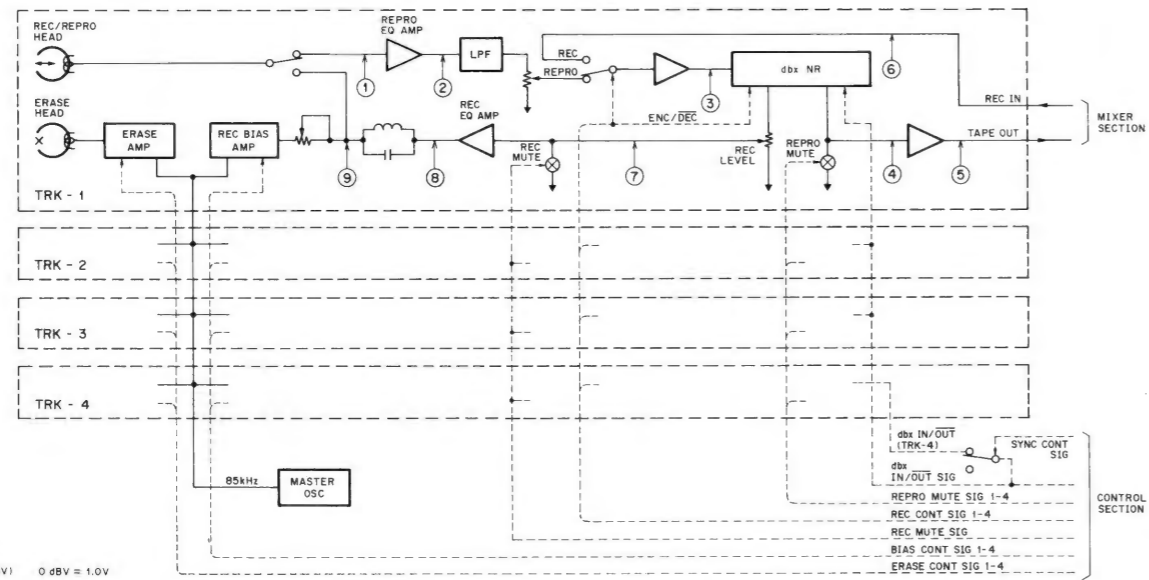
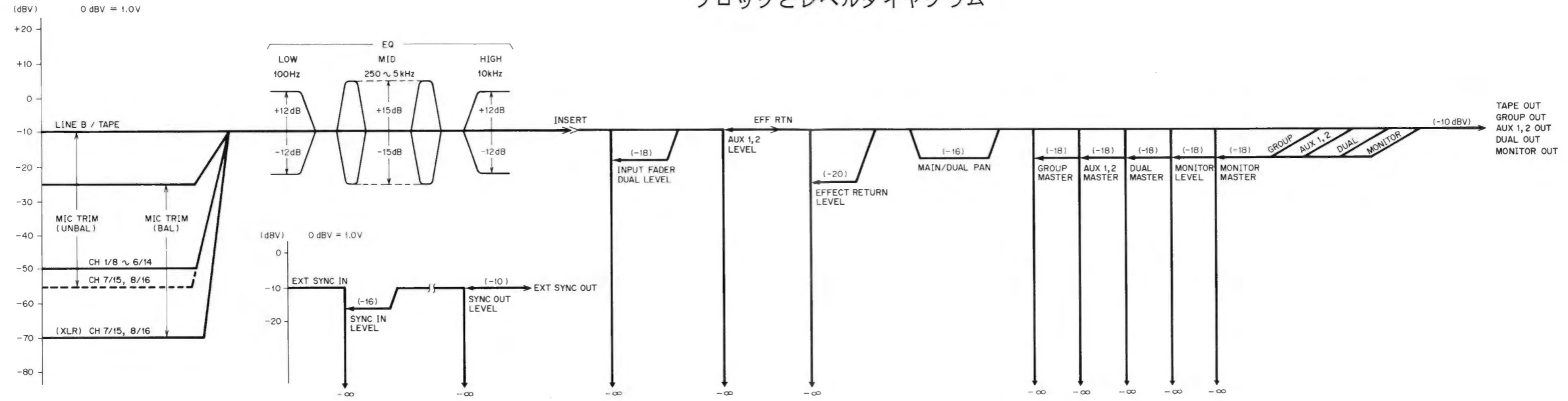
|    | COM 1  | COM 2 |
|----|--------|-------|
| 1  | COM 1  | —     |
| 2  | START  | 1d    |
| 3  | 1c     | 1e    |
| 4  | 1g     | 1f    |
| 5  | 1b     | 1a    |
| 6  | RHSL   | 2d    |
| 7  | 2c     | 2e    |
| 8  | 2g     | 2f    |
| 9  | 2b     | 2a    |
| 10 | COLUMN | 3d    |
| 11 | 3c     | 3e    |
| 12 | 3g     | 3f    |
| 13 | 3b     | 3a    |
| 14 | (1)    | 4d    |
| 15 | 4c     | 4e    |
| 16 | 4g     | 4f    |
| 17 | 4b     | 4a    |
| 18 | OUT    | 5d    |
| 19 | 5c     | 5e    |
| 20 | 5g     | 5f    |
| 21 | 5b     | 5a    |
| 22 | IN     | 6d    |
| 23 | 6c     | 6e    |
| 24 | 6g     | 6f    |
| 25 | 6b     | 6a    |
| 26 | MEMO 1 | 7d    |
| 27 | 7c     | 7e    |
| 28 | 7g     | 7f    |
| 29 | 7b     | 7a    |
| 30 | MEMO 2 | 8d    |
| 31 | 8c     | 8e    |
| 32 | 8g     | 8f    |
| 33 | 8b     | 8a    |
| 34 | (2)    | —     |
| 35 | —      | COM 2 |



(1) : AUTO IN/OUT  
(2) : REPEAT 1-2

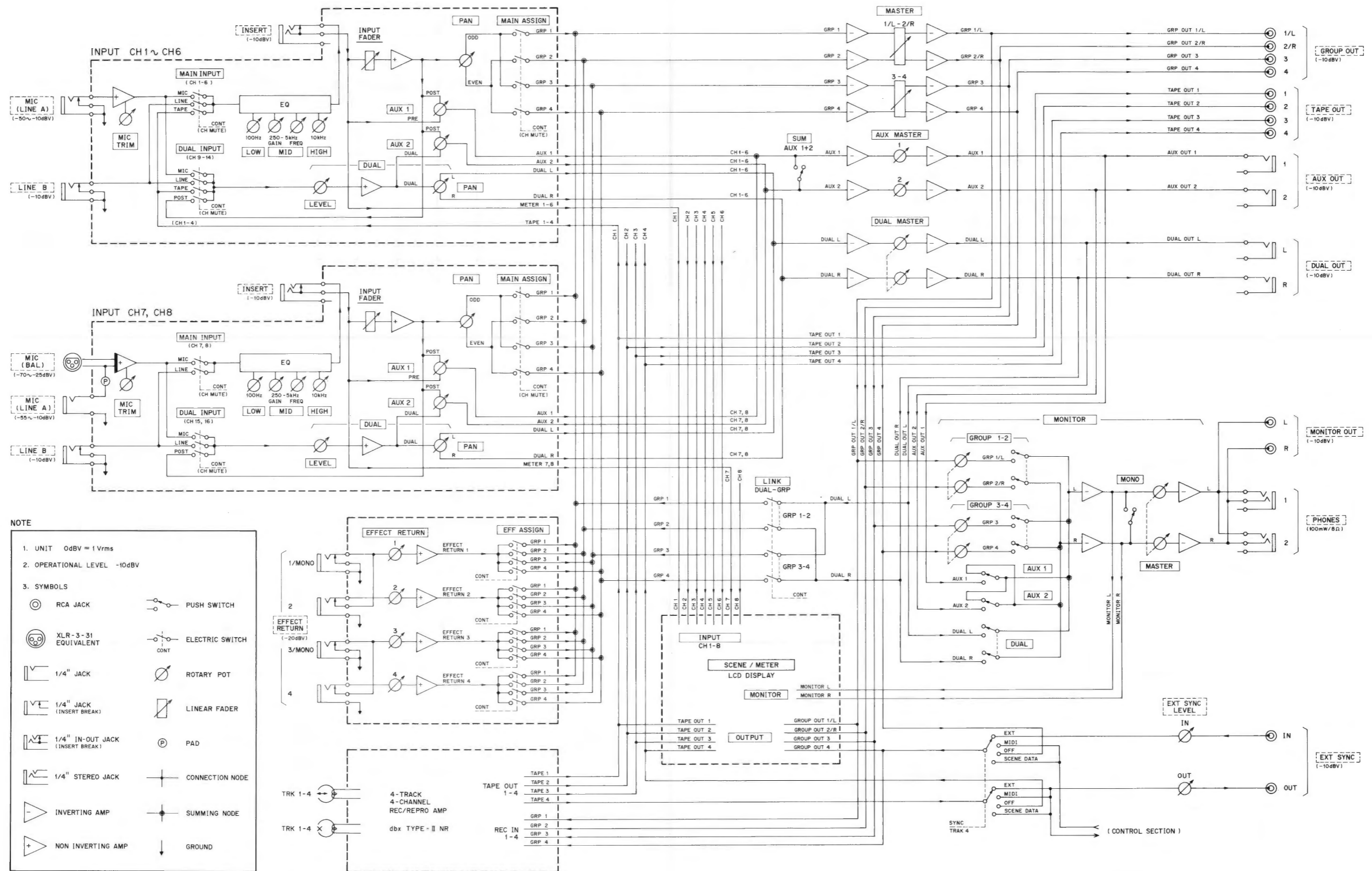


## 12. BLOCK AND LEVEL DIAGRAM ブロックとレベルダイヤグラム



13. SCHEMATIC DIAGRAM

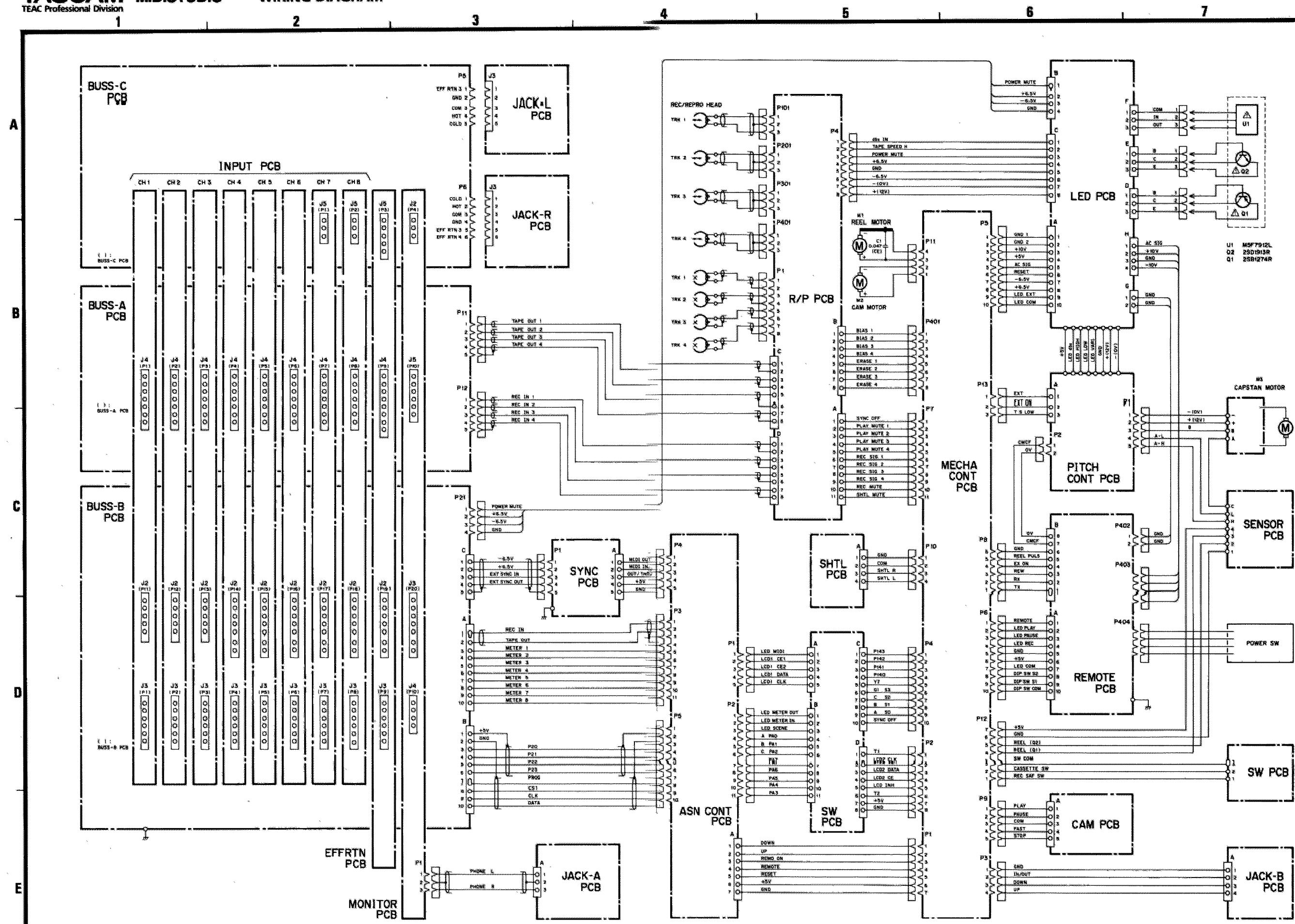
回路图



**NOTE**

- UNIT 0dBV = 1 Vrms
- OPERATIONAL LEVEL -10dBV
- SYMBOLS

|  |                                 |  |                 |
|--|---------------------------------|--|-----------------|
|  | RCA JACK                        |  | PUSH SWITCH     |
|  | XLR-3-31 EQUIVALENT             |  | ELECTRIC SWITCH |
|  | 1/4" JACK                       |  | ROTARY POT      |
|  | 1/4" JACK (INSERT BREAK)        |  | LINEAR FADER    |
|  | 1/4" IN-OUT JACK (INSERT BREAK) |  | PAD             |
|  | 1/4" STEREO JACK                |  | CONNECTION NODE |
|  | INVERTING AMP                   |  | SUMMING NODE    |
|  | NON INVERTING AMP               |  | GROUND          |



**SCHEMATIC DIAGRAMS**

**644**

**INSTRUCTIONS FOR SERVICE PERSONNEL**  
BEFORE RETURNING APPLIANCE TO THE CUSTOMER, MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT.

- NOTES**
1. Resistor values are in ohms (k = kilo-ohms, M = meg-ohms)
  2. Capacitor values are in microfarads (p = picofarads).

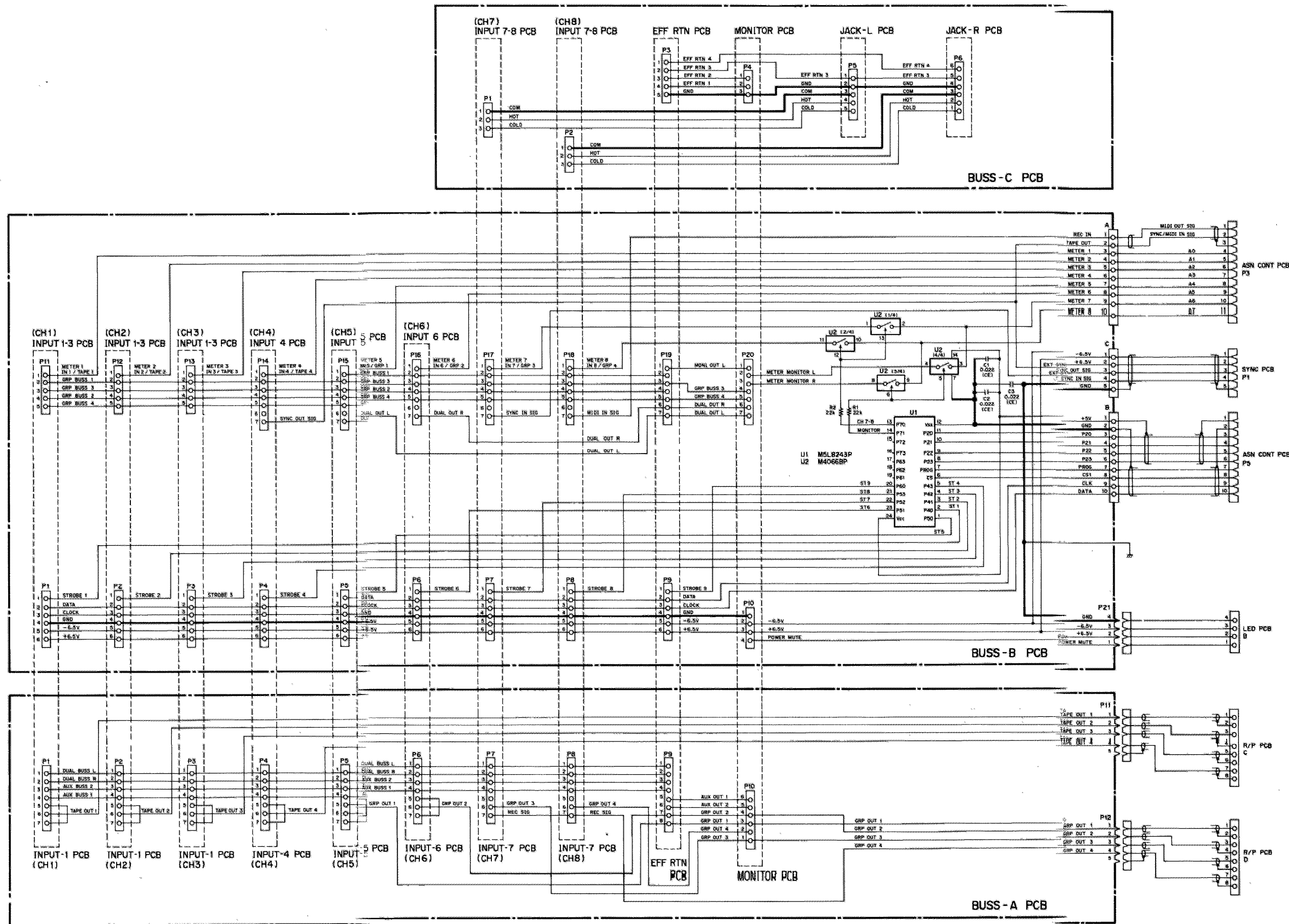
A

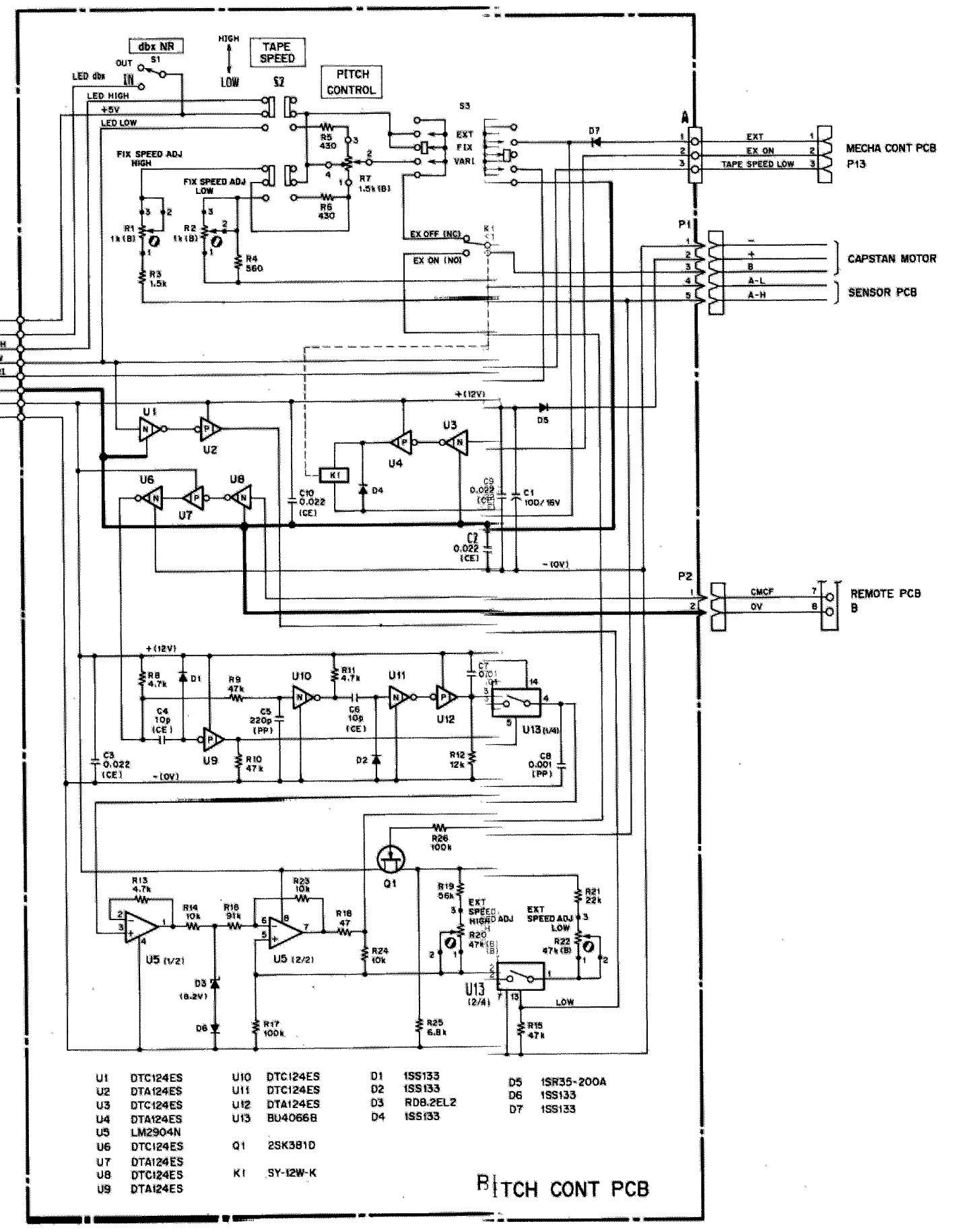
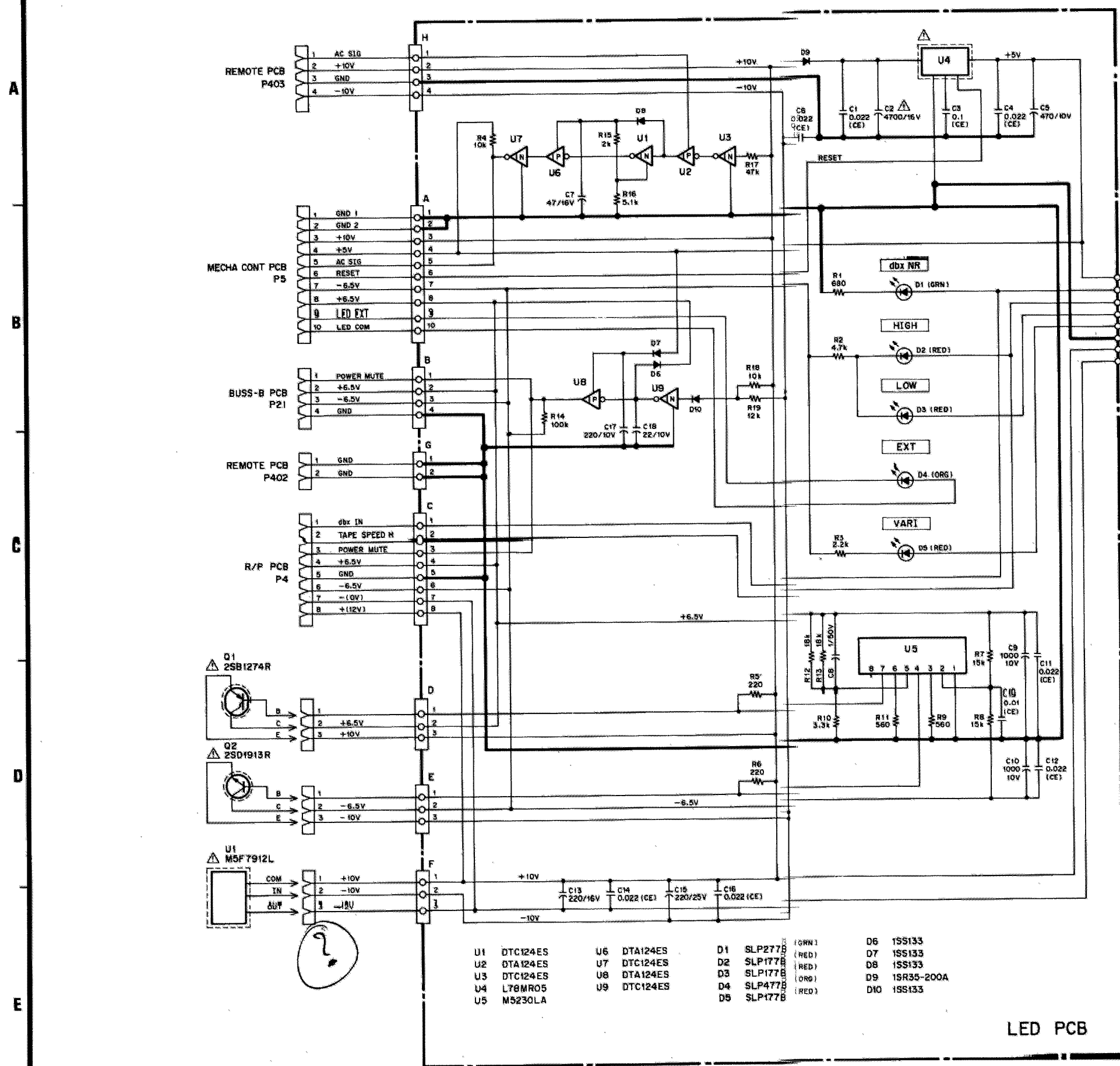
B

C

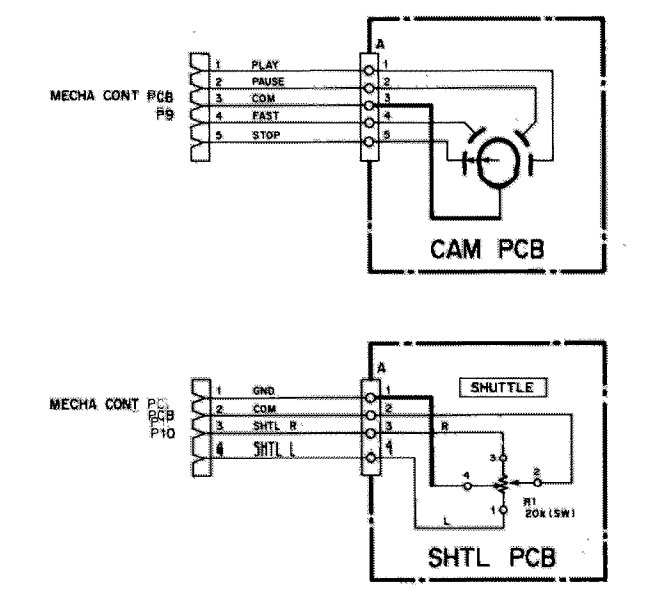
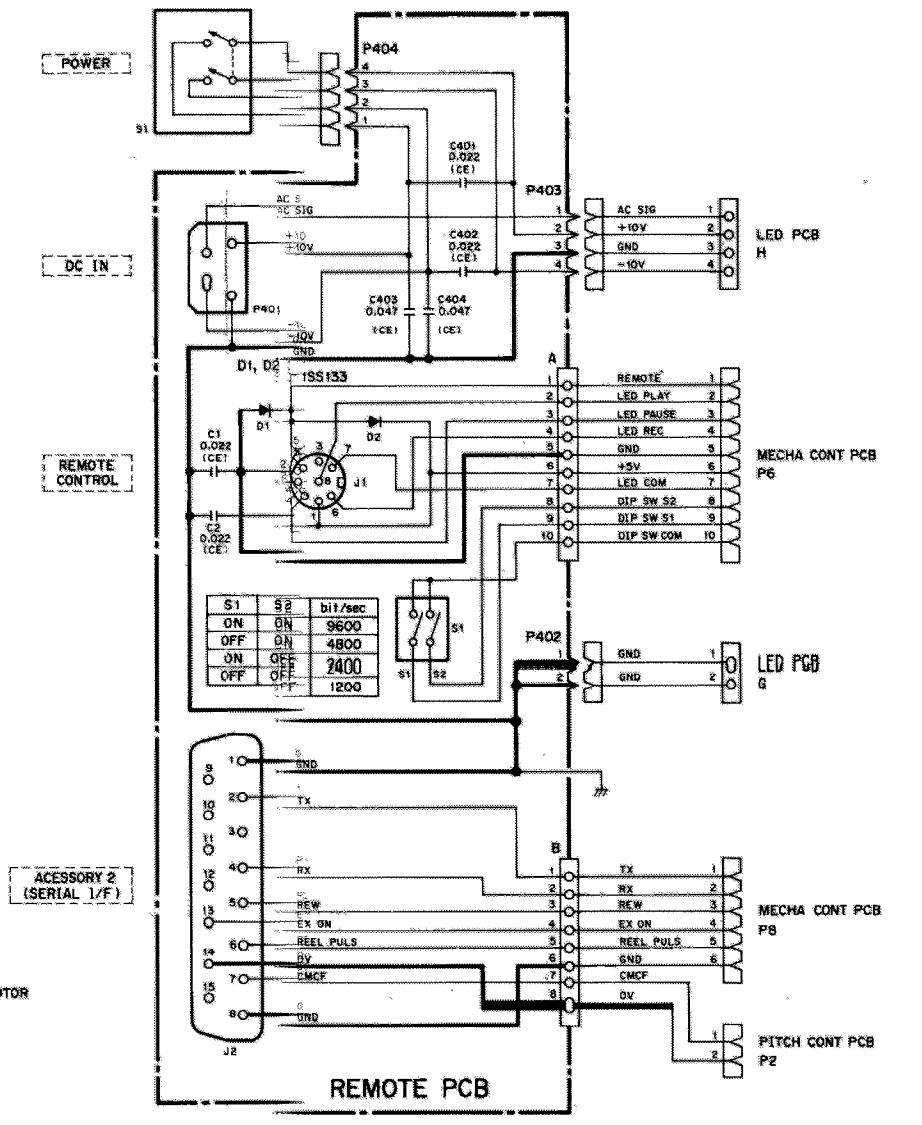
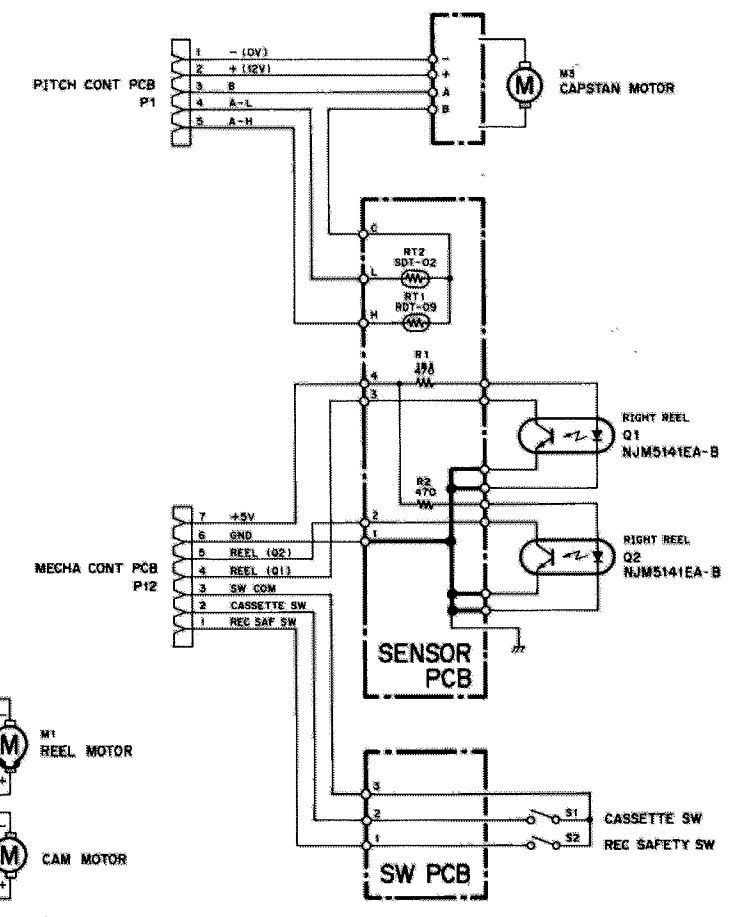
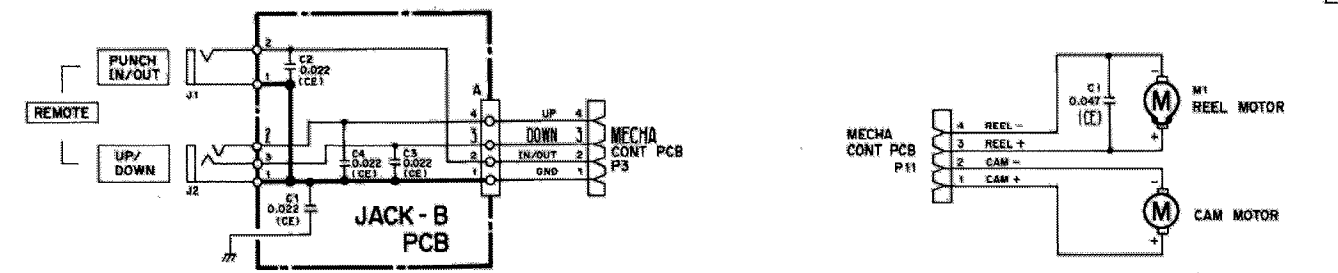
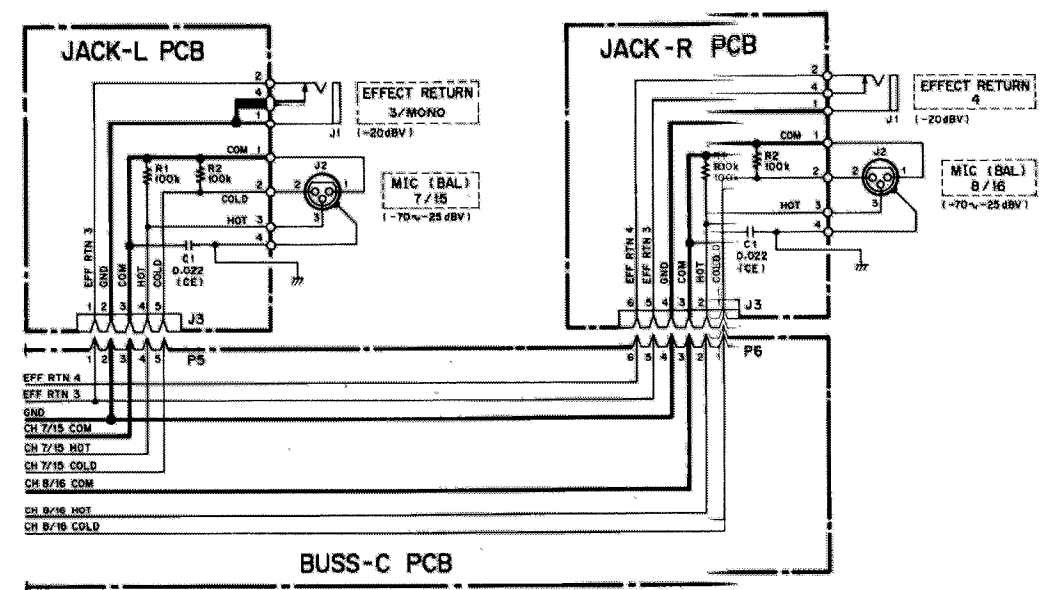
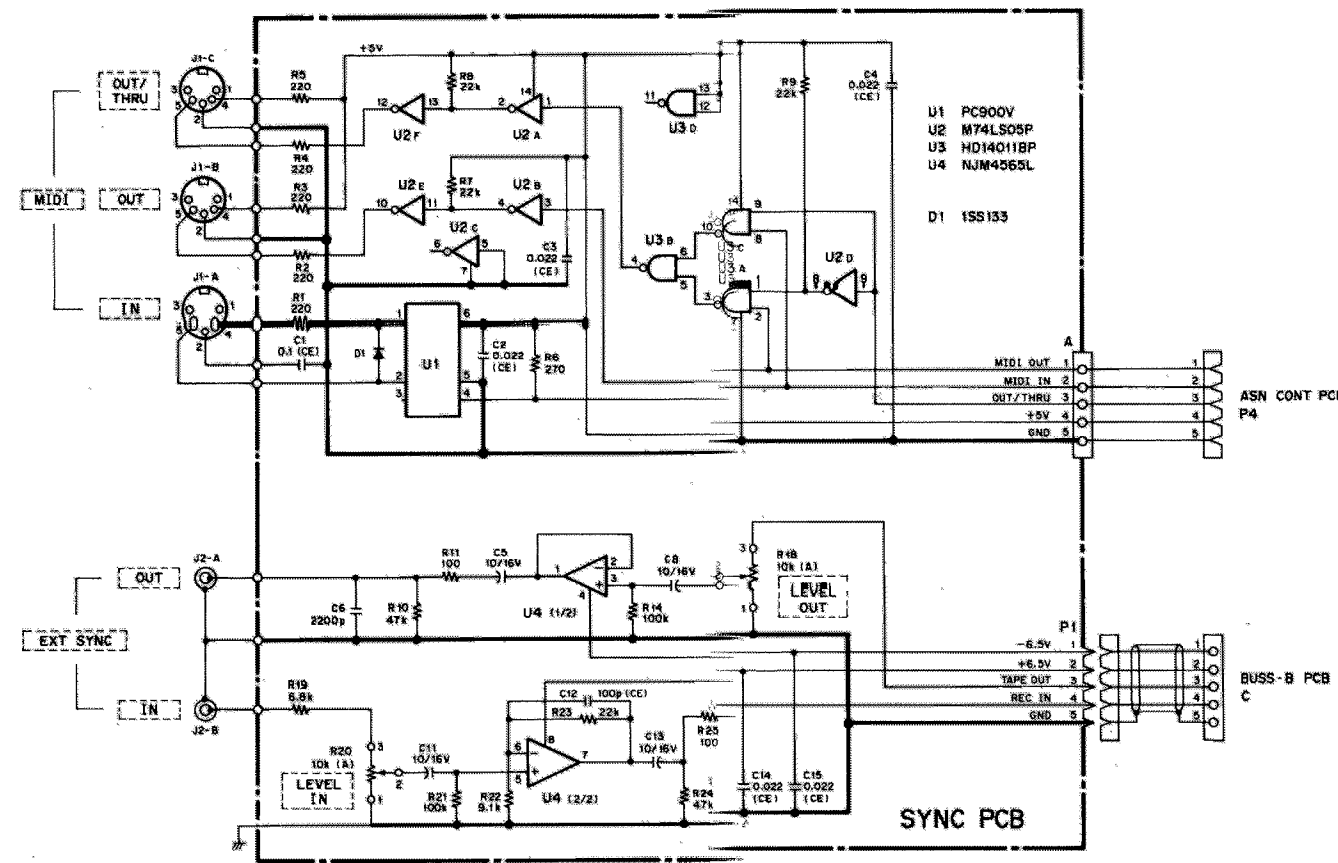
D

E



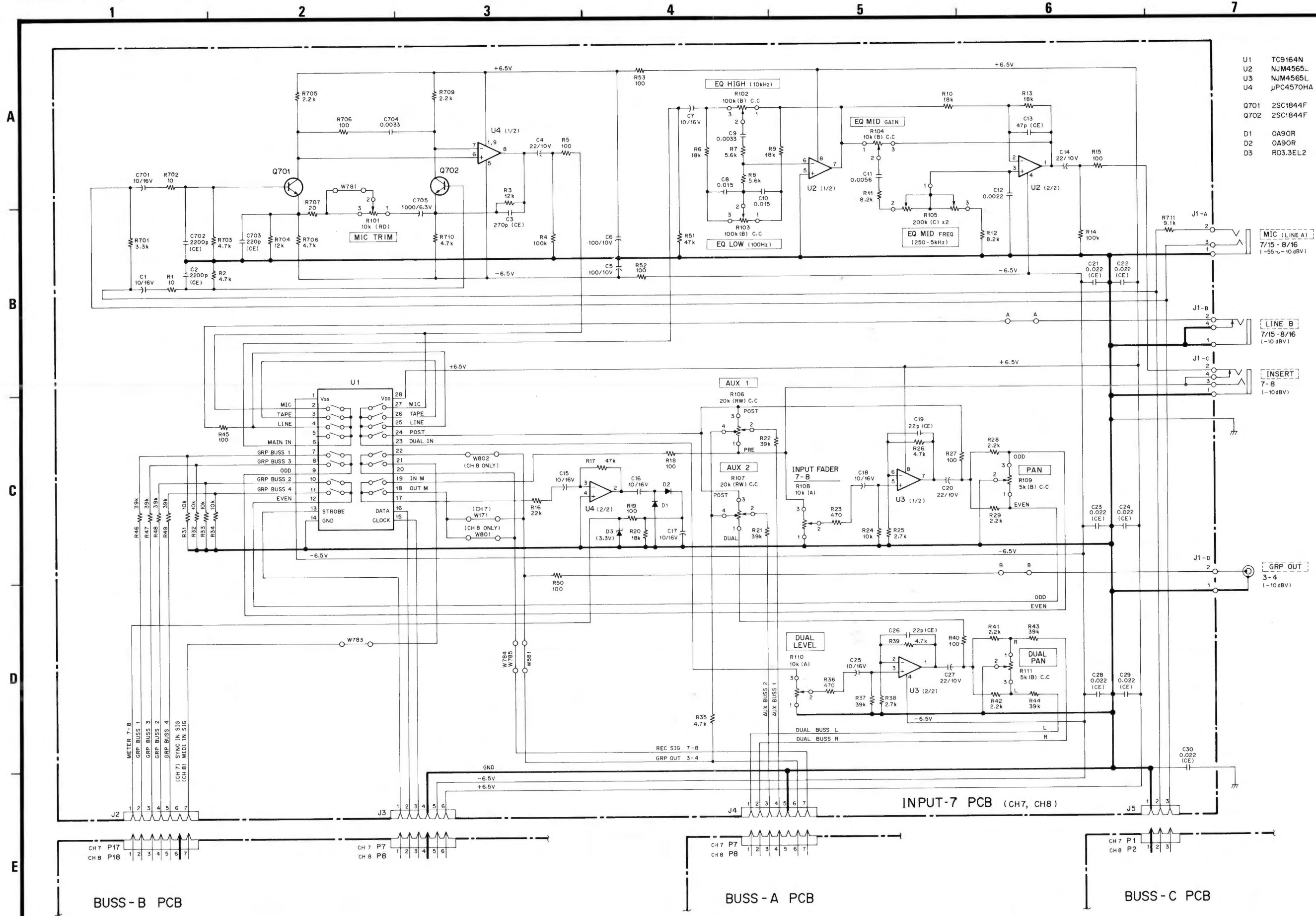


A  
B  
C  
D  
E







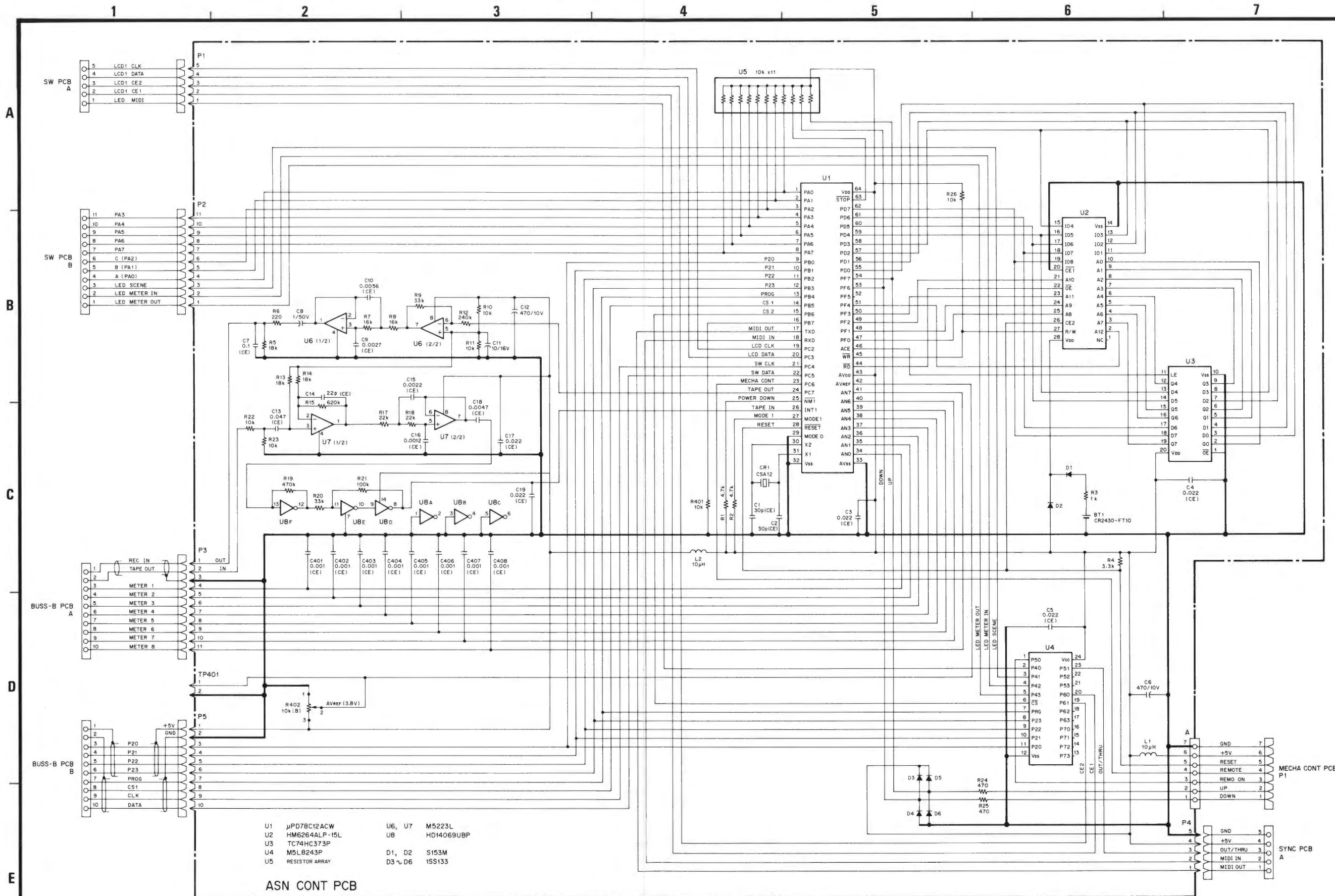


- U1 TC9164N
- U2 NJM4565L
- U3 NJM4565L
- U4 μPC4570HA
- Q701 2SC1844F
- Q702 2SC1844F
- D1 OA90R
- D2 OA90R
- D3 RD3.3EL2

BUSS - B PCB

BUSS - A PCB

BUSS - C PCB



ASN CONT PCB

— ASN CONT PCB —

1

2

3

4

5

6

7

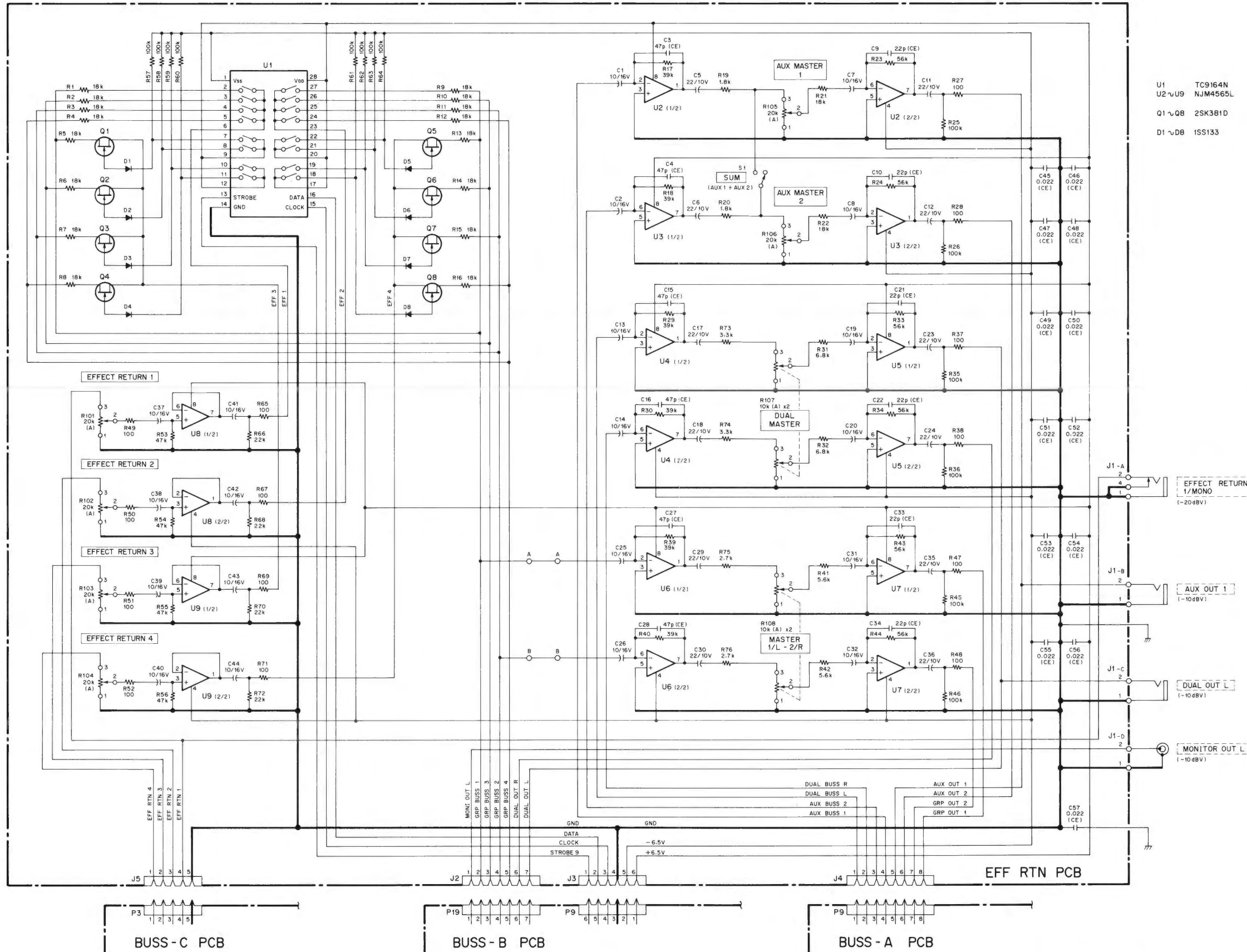
A

B

C

D

E



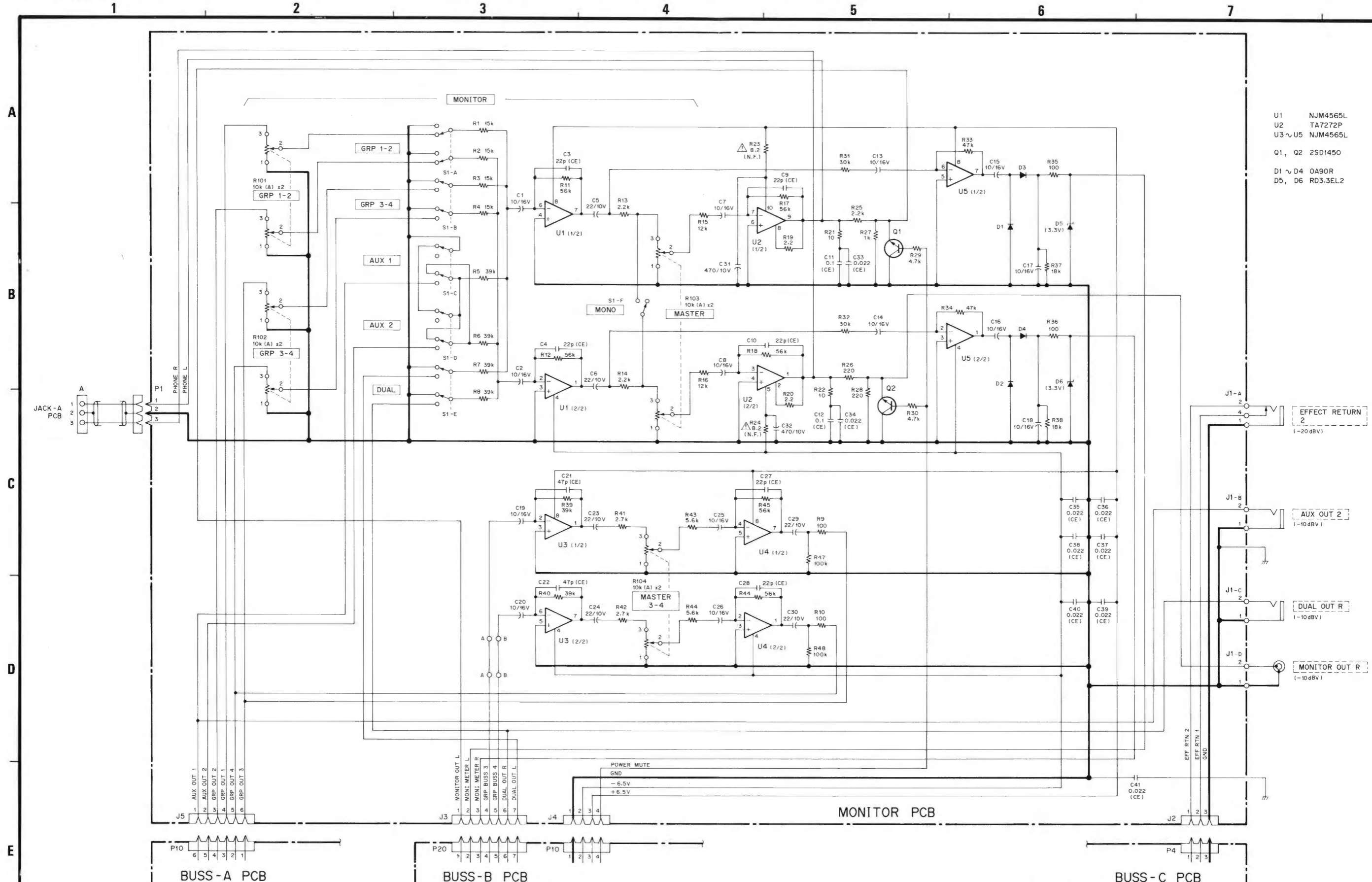
- U1 TC9164N
- U2~U9 NJM4565L
- Q1~Q8 2SK381D
- D1~D8 1SS133

BUSS - C PCB

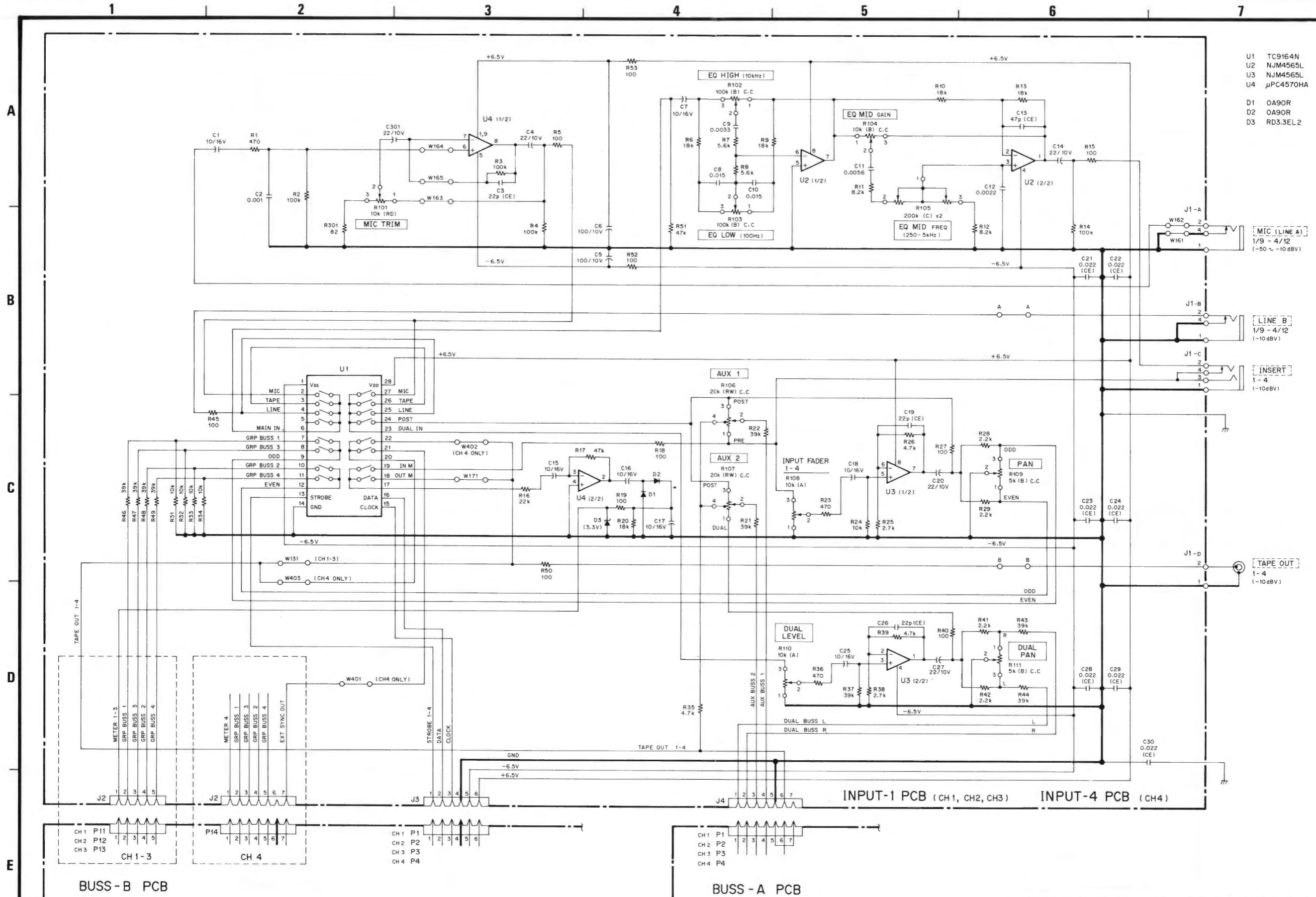
BUSS - B PCB

BUSS - A PCB

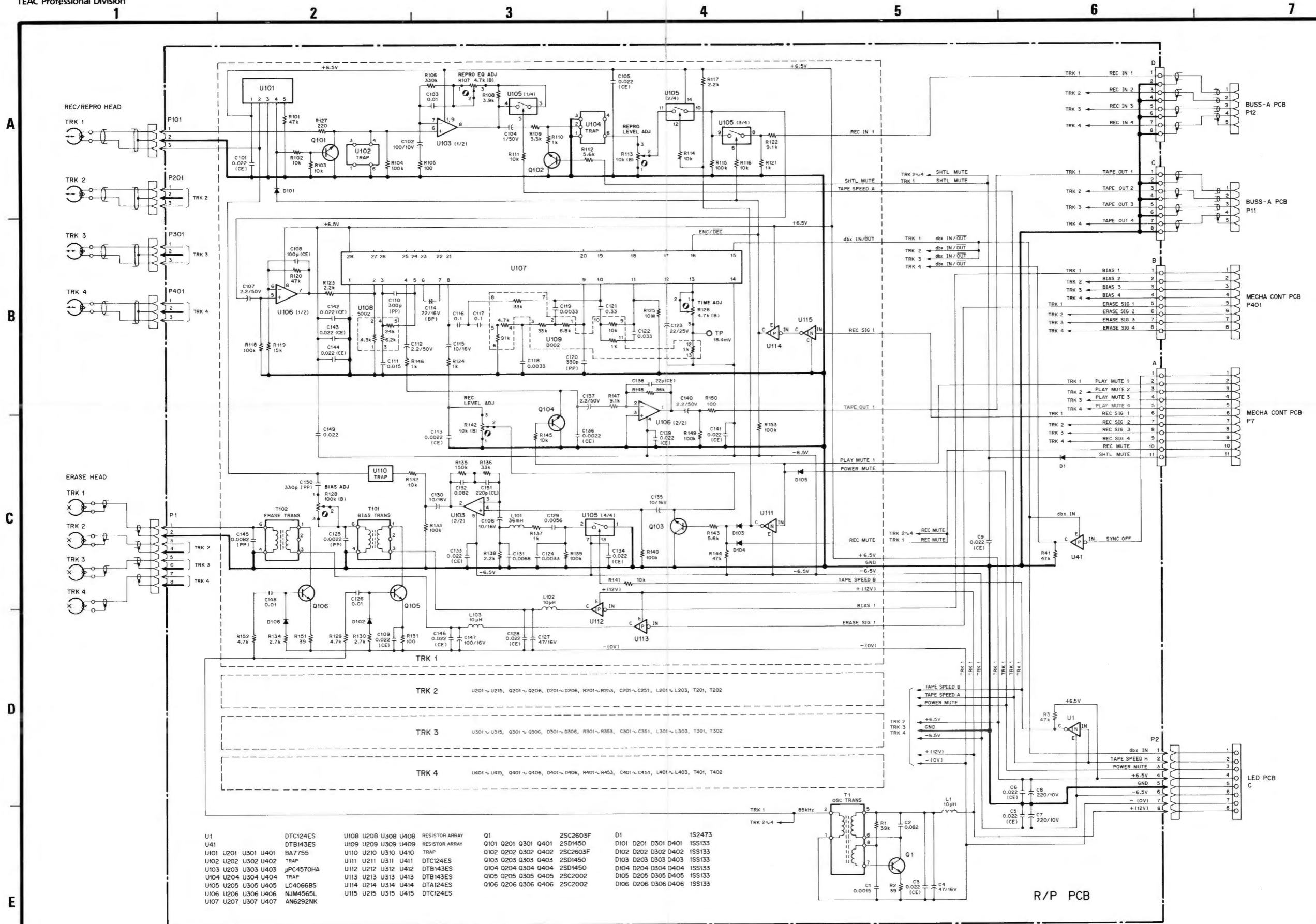
EFF RTN PCB



- U1 NJM4565L
- U2 TA7272P
- U3~U5 NJM4565L
- Q1, Q2 2SD1450
- D1~D4 OA90R
- D5, D6 RD3.3EL2

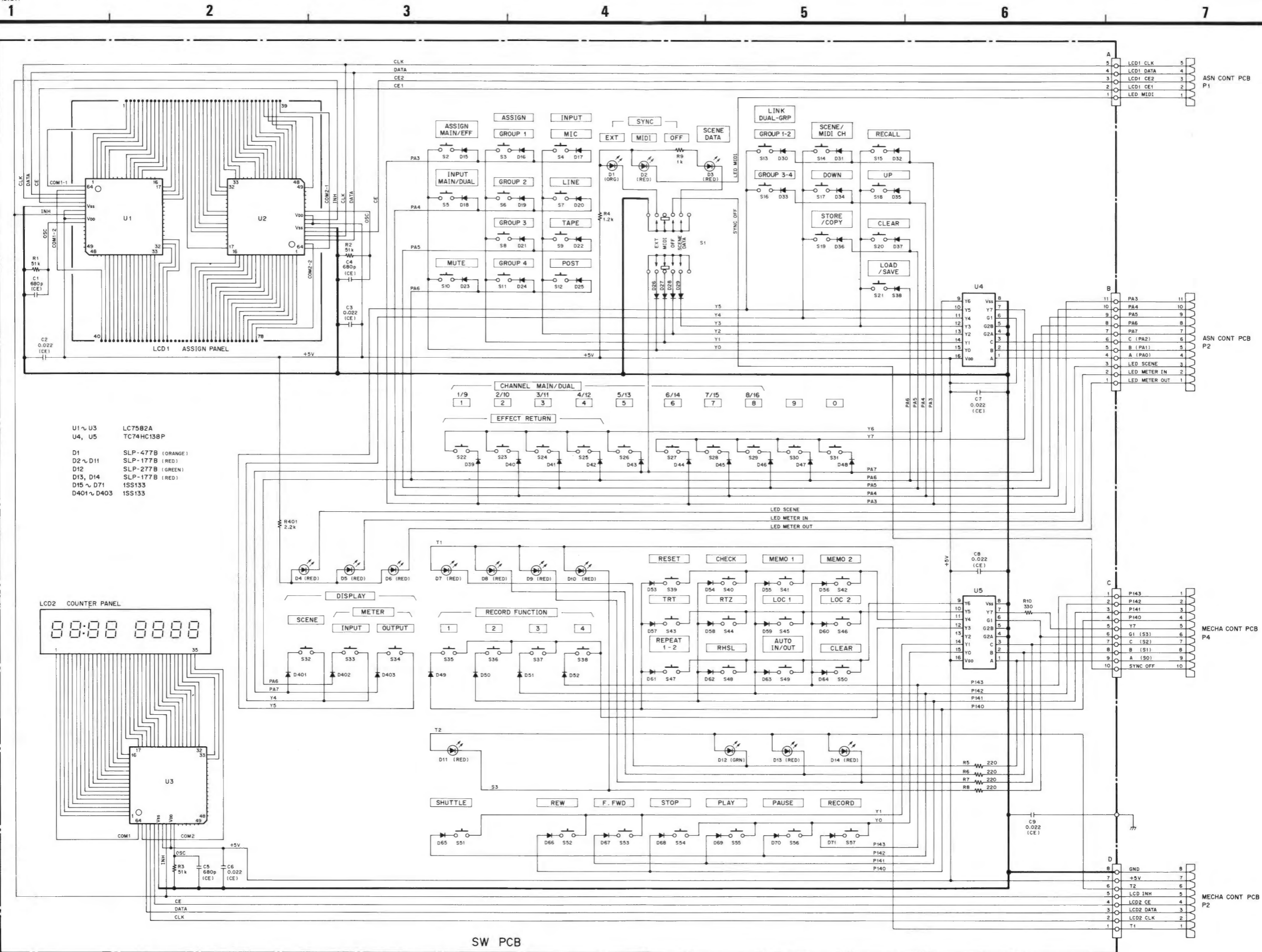


- U1 TC9164N
- U2 NJM4565L
- U3 NJM4565L
- U4  $\mu$ PC4570HA
- D1 OA90R
- D2 OA90R
- D3 RD3.3EL2



|      |          |      |      |      |      |                |      |          |      |        |
|------|----------|------|------|------|------|----------------|------|----------|------|--------|
| U1   | DTC124ES | U108 | U208 | U308 | U408 | RESISTOR ARRAY | Q1   | 2SC2603F | D1   | 1S2473 |
| U41  | DTB143ES | U109 | U209 | U309 | U409 | RESISTOR ARRAY | Q101 | 2SD1450  | D101 | 1SS133 |
| U101 | BA7755   | U110 | U210 | U310 | U410 | TRAP           | Q102 | 2SC2603F | D102 | 1SS133 |
| U102 | U302     | U111 | U211 | U311 | U411 | DTC124ES       | Q103 | 2SD1450  | D103 | 1SS133 |
| U103 | U303     | U112 | U212 | U312 | U412 | DTB143ES       | Q104 | 2SD1450  | D104 | 1SS133 |
| U104 | U304     | U113 | U213 | U313 | U413 | DTB143ES       | Q105 | 2SC2002  | D105 | 1SS133 |
| U105 | U305     | U114 | U214 | U314 | U414 | DTA124ES       | Q106 | 2SC2002  | D106 | 1SS133 |
| U106 | U306     | U115 | U215 | U315 | U415 | DTC124ES       |      |          |      |        |
| U107 | U307     |      |      |      |      |                |      |          |      |        |

- TRK 1: U101 ~ U105, Q101 ~ Q105, R101 ~ R105, C101 ~ C105, R110 ~ R115, C110 ~ C115, R120 ~ R125, C120 ~ C125, R130 ~ R135, C130 ~ C135, R140 ~ R145, C140 ~ C145, R150 ~ R155, C150 ~ C155, R160 ~ R165, C160 ~ C165, R170 ~ R175, C170 ~ C175, R180 ~ R185, C180 ~ C185, R190 ~ R195, C190 ~ C195, R200 ~ R205, C200 ~ C205, R210 ~ R215, C210 ~ C215, R220 ~ R225, C220 ~ C225, R230 ~ R235, C230 ~ C235, R240 ~ R245, C240 ~ C245, R250 ~ R255, C250 ~ C255, R260 ~ R265, C260 ~ C265, R270 ~ R275, C270 ~ C275, R280 ~ R285, C280 ~ C285, R290 ~ R295, C290 ~ C295, R300 ~ R305, C300 ~ C305, R310 ~ R315, C310 ~ C315, R320 ~ R325, C320 ~ C325, R330 ~ R335, C330 ~ C335, R340 ~ R345, C340 ~ C345, R350 ~ R355, C350 ~ C355, R360 ~ R365, C360 ~ C365, R370 ~ R375, C370 ~ C375, R380 ~ R385, C380 ~ C385, R390 ~ R395, C390 ~ C395, R400 ~ R405, C400 ~ C405, R410 ~ R415, C410 ~ C415, R420 ~ R425, C420 ~ C425, R430 ~ R435, C430 ~ C435, R440 ~ R445, C440 ~ C445, R450 ~ R455, C450 ~ C455, R460 ~ R465, C460 ~ C465, R470 ~ R475, C470 ~ C475, R480 ~ R485, C480 ~ C485, R490 ~ R495, C490 ~ C495, R500 ~ R505, C500 ~ C505, R510 ~ R515, C510 ~ C515, R520 ~ R525, C520 ~ C525, R530 ~ R535, C530 ~ C535, R540 ~ R545, C540 ~ C545, R550 ~ R555, C550 ~ C555, R560 ~ R565, C560 ~ C565, R570 ~ R575, C570 ~ C575, R580 ~ R585, C580 ~ C585, R590 ~ R595, C590 ~ C595, R600 ~ R605, C600 ~ C605, R610 ~ R615, C610 ~ C615, R620 ~ R625, C620 ~ C625, R630 ~ R635, C630 ~ C635, R640 ~ R645, C640 ~ C645, R650 ~ R655, C650 ~ C655, R660 ~ R665, C660 ~ C665, R670 ~ R675, C670 ~ C675, R680 ~ R685, C680 ~ C685, R690 ~ R695, C690 ~ C695, R700 ~ R705, C700 ~ C705, R710 ~ R715, C710 ~ C715, R720 ~ R725, C720 ~ C725, R730 ~ R735, C730 ~ C735, R740 ~ R745, C740 ~ C745, R750 ~ R755, C750 ~ C755, R760 ~ R765, C760 ~ C765, R770 ~ R775, C770 ~ C775, R780 ~ R785, C780 ~ C785, R790 ~ R795, C790 ~ C795, R800 ~ R805, C800 ~ C805, R810 ~ R815, C810 ~ C815, R820 ~ R825, C820 ~ C825, R830 ~ R835, C830 ~ C835, R840 ~ R845, C840 ~ C845, R850 ~ R855, C850 ~ C855, R860 ~ R865, C860 ~ C865, R870 ~ R875, C870 ~ C875, R880 ~ R885, C880 ~ C885, R890 ~ R895, C890 ~ C895, R900 ~ R905, C900 ~ C905, R910 ~ R915, C910 ~ C915, R920 ~ R925, C920 ~ C925, R930 ~ R935, C930 ~ C935, R940 ~ R945, C940 ~ C945, R950 ~ R955, C950 ~ C955, R960 ~ R965, C960 ~ C965, R970 ~ R975, C970 ~ C975, R980 ~ R985, C980 ~ C985, R990 ~ R995, C990 ~ C995, R1000 ~ R1005, C1000 ~ C1005.
- TRK 2: U201 ~ U215, Q201 ~ Q206, D201 ~ D206, R201 ~ R253, C201 ~ C251, L201 ~ L203, T201, T202
- TRK 3: U301 ~ U315, Q301 ~ Q306, D301 ~ D306, R301 ~ R353, C301 ~ C351, L301 ~ L303, T301, T302
- TRK 4: U401 ~ U415, Q401 ~ Q406, D401 ~ D406, R401 ~ R453, C401 ~ C451, L401 ~ L403, T401, T402

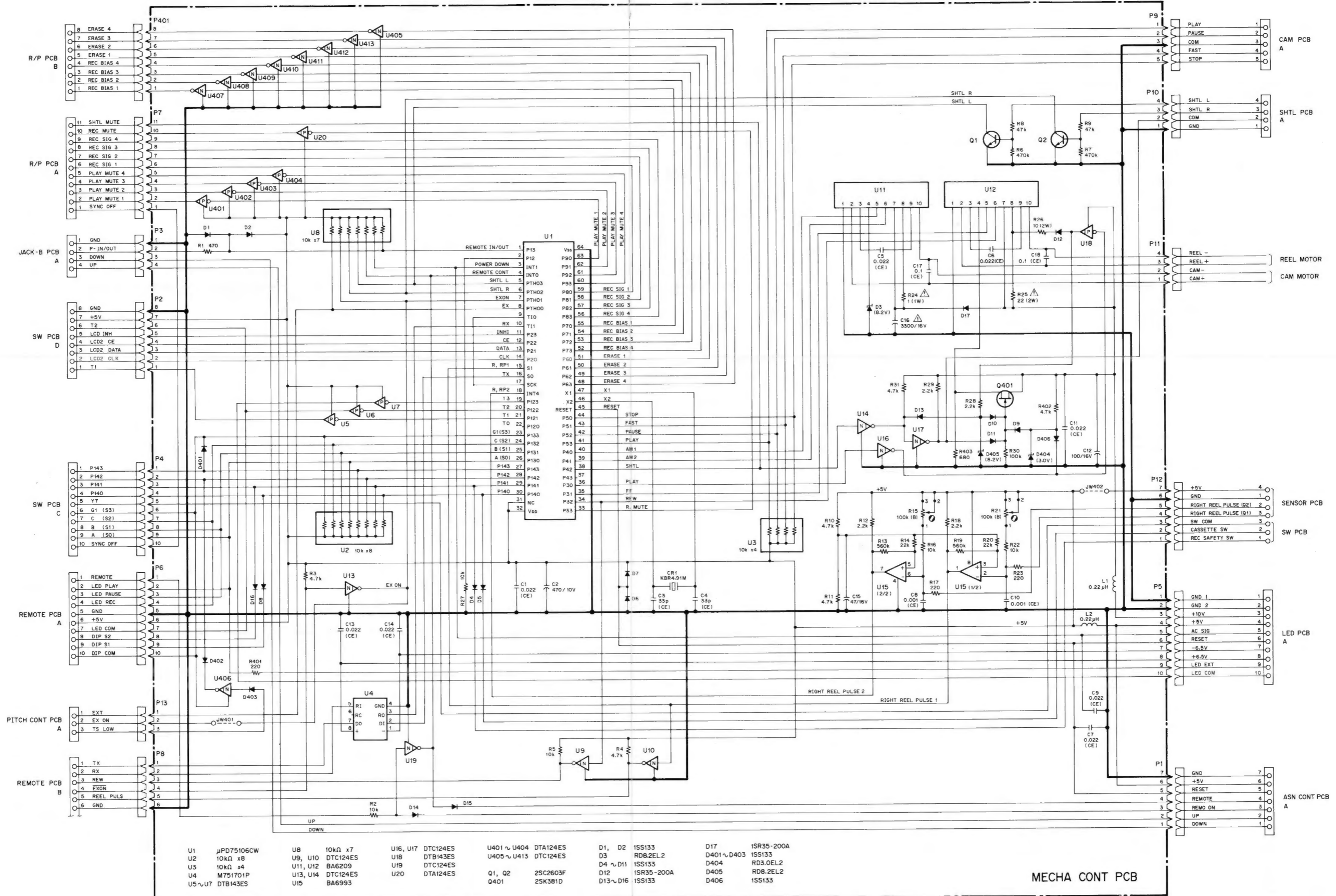


SW PCB



1 2 3 4 5 6 7

A  
B  
C  
D  
E



|         |            |          |          |          |          |             |            |           |            |             |            |
|---------|------------|----------|----------|----------|----------|-------------|------------|-----------|------------|-------------|------------|
| U1      | μPD75106CW | U8       | 10kΩ x7  | U16, U17 | DTC124ES | U401 ~ U404 | DTA124ES   | D1, D2    | ISS133     | D17         | ISR35-200A |
| U2      | 10kΩ x8    | U9, U10  | DTC124ES | U18      | DTB143ES | U405 ~ U413 | DTC124ES   | D3        | RDB.2EL2   | D401 ~ D403 | ISS133     |
| U3      | 10kΩ x4    | U11, U12 | BA6209   | U19      | DTC124ES | Q1, Q2      | 2SC2603F   | D4 ~ D11  | ISS133     | D404        | RDB.0EL2   |
| U4      | M751701P   | U13, U14 | DTC124ES | U20      | DTA124ES | D12         | ISR35-200A | D12       | ISR35-200A | D405        | RDB.2EL2   |
| U5 ~ U7 | DTB143ES   | U15      | BA6993   |          |          | Q401        | 2SK381D    | D13 ~ D16 | ISS133     | D406        | ISS133     |

MECHA CONT PCB

